THE PLANT DISEASE REPORTER

Issued By

THE PLANT DISEASE SURVEY

Division of Mycology and Disease Survey

BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING

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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

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Plant Industry Station — Beltsville, Maryland
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FURTHER OBSERVATIONS ON THE INHERITANCE OF RESISTANCE TO FUSARIUM WILT IN WATERMELON

G. K. Parris

Welch and Melhus (6) in 1942 reported that when a wilt-resistant watermelon was crossed with a melon susceptible to Fusarium wilt, caused by the fungus Fusarium oxysporum (E.F.Sm.) f. niveum Snyder & Hansen, the F_1 are not always susceptible to the disease and do not always die when planted on wilt-infested land. Previously, investigators (1, 2, 3, 4, and 5) had always believed that the F_1 died, and advised workers to plant the F_1 on land free of wilt if F_2 seed was desired. Later, these second generation seed were planted on wilt-infested land so that susceptible individuals might be eliminated by natural processes. As Welch and Melhus point out, however, the resistance that had been incorporated into the watermelon had always come from a citron, such as the Conqueror variety developed by Orton (2), or from the progeny of a citron that had been crossed with a watermelon, such as the varieties Iowa Belle and Iowa King. In one cross, Dixie Queen x (Iowa Belle x Jugoslavia 7 x Iowa Belle), the F_1 were 70 to 85 percent resistant, in the two crosses (Japan 7 x Thurmond Grey and Japan 7 x Dixie Queen) the F_1 were 80 percent resistant, while in 10 additional crosses the F_1 showed wilt resistance readings which ranged from 50 percent to zero. In all instances wilt susceptible varieties planted alongside the F_1 to serve as checks died 100 percent.

Segregation for susceptibility and resistance to Fusarium wilt in watermelon takes place in the F_2 generation as expected, but to date no one has been able to obtain genetic ratios, either in the greenhouse or in the field, and inheritance remains largely undetermined as to the number of factors involved.

This short note is to report results obtained during the past three years which substantiate the results reported by Welch and Melhus, namely that the F_1 from the cross of wilt-resistant watermelon x wilt-susceptible watermelon are not always susceptible to wilt. Grown on heavily wilt-infested land at Leesburg, Florida, the F_1 have survived, and produced melons, as high as 96 percent (Hawkesbury x Cletex), 85 percent (Blacklee x Cletex), or as low as 54 percent (Flaming Delicious x Black Kleckley), or died 100 percent (Cannon Ball x Black Kleckley). When accession number 610 of this laboratory has served as the resistant parent in a cross with Cannon Ball, the F_1 have lived 71 percent on infested soil where Cannon Ball lived but 20 percent. Detailed data are given in Table 1. In the two instances where survival of F_2 were obtained, the percentages obtained, 55 in one case and 51 in the other, tell us nothing about the method of inheritance of resistance to wilt.

Table 1. Percentage survival of hybrid watermelon plants when grown on wilt-infested land, Leesburg, Florida.

Cross or Variety	Genera-tion	No. Plants	Plants Alive	Percent
Blacklee x Cletex	F_1	54	46	85
Cletex[a]		24	0	0
Blacklee		24	22	91
Hawkesbury x Cletex	F_1	30	29	96
Hawkesbury		24	22	91
Cannon Ball x #610	F_1	132	94	71
Ditto	F_2	96	53	55
Cannon Ball		24	5	20
#610[b]		24	20	83
Cannon Ball x Black Kleckley	F_1	24	0	0
Black Kleckley[c]		24	17	70
Flaming Delicious x Black Kleckley	F_1	24	13	54
Ditto	F_2	70	36	51
Flaming Delicious[d]		24	5	20

[a] Also known as Spotted Watson; susceptible to wilt.

[b] An inbred line, now in F_7, smaller than Cannon Ball but resembling it in shape and seed color with slightly lighter rind color; resistant to wilt.

[c] Developed by the Iowa Agricultural Experiment Station for resistance to wilt and anthracnose.

[d] A local name for a wilt-susceptible variety.

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1. Bennett, L. S. Studies on the inheritance of resistance to wilt (Fusarium niveum) in watermelon. Jour. Agr. Res. 53: 295-306. 1936.
2. Orton, W. A. The development of disease resistant varieties of plants. IV Conf. Intern. de Genetique, Paris. Comptes Rendus et Rapports, pp. 247-265. 1911.
3. Porter, D. R. Varietal resistance of watermelons to wilt (Fusarium niveum E.F.Sm.) Phytopath. (Abst.) 18: 144. 1928.
4. _____, and I. E. Melhus. The pathogenicity of Fusarium niveum (E.F.Sm.) and the development of wilt resistant strains of Citrullus vulgaris Schrad. Iowa Agr. Exp. Sta. Res. Bull. 149: 123-184. 1932.
5. Walker, M. N. A wilt-resistant watermelon for Florida. Florida Agr. Expt. Sta. Bull. 288: 1-13. 1936.
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WATERMELON AND GRAPE INVESTIGATIONS LABORATORY, FLORIDA AGRICULTURAL EXPERIMENT STATION, LEESBURG, FLORIDA

WEATHER AND THE INCIDENCE OF SCLEROTINIA SCLEROTIORUM ON VEGETABLES IN SOUTH FLORIDA FROM 1944 TO 1948

W. D. Moore

During the course of investigations of the sclerotiniose (Sclerotinia sclerotiorum (Lib.) Massee) disease of vegetables in south Florida since 1944, observations were made on the possible effects of rainfall and temperature on the development of disease outbreaks. Readings were made at regular intervals at Pompano and at Homestead, the two principal mid-winter vegetable-producing areas of the State. Plantings in the Pompano district are made on light sandy soils of low water-holding capacity, while in the Homestead district vegetables are grown on marl soils of high water-holding capacity. Owing to the difference in the soil types, moisture conditions in the two localities vary to a marked degree, fluctuating quite rapidly at Pompano and remaining fairly constant at Homestead. The principal crops at Pompano are beans, peppers, and squash, while those at Homestead are beans, potatoes, and tomatoes. Since beans are planted at approximately the same time at both locations this crop was chosen as an indicator for these observations. Planting usually starts in late October or early November and continues at regular intervals until February, thus offering an opportunity to make observations in fields of different ages over a period of three or more months.

Temperature

Brooks (1) has shown that Sclerotinia sclerotiorum apothecia usually develop within three to four weeks after the mean daily temperature falls to 70° F. or below. Since sclerotiniose has appeared in south Florida each year since 1944 between December 10 and 15, mean temperatures were tabulated for each year, beginning November 20th and extending until February 1st. This allowed the average time for apothecial development prior to first appearance of the disease and included the period of greatest sclerotiniose incidence during the growing season. The mean daily temperatures during this period in 1944-45 and 1945-46 were between 60° and 70° F. for most of the time at Pompano and at Homestead. For the same period in 1946-47 mean daily temperatures were above 70° F. at both locations. During 1947-48 they were above 70° F. except in January, when they were between 60° and 70° F. for 25 days at Pompano and 29 days at Homestead. These readings indicate that two of the four seasons were comparatively cool, one relatively warm, and one warm for the first 40 days, then cool for the last 25 to 29 days.

Rainfall

Rainfall at Pompano and at Homestead during 1944-45 for the above period was the lightest of the four years. It was somewhat heavier at

both locations in 1945-46, but still less than the four-year average. It was above the average at both locations in 1946-47, above average at Homestead in 1947-48, and approximately average for this season at Pompano. For the four seasons in question, rainfall was below average for the first two seasons at both locations, above average for the last two at Homestead, and above average at Pompano for the third season and about average the fourth season.

Sclerotiniose Incidence

Sclerotiniose appeared each year at Pompano between December 9 and 15; and at Homestead between December 3 and 9 in all years except 1945-46 when it appeared on December 30. This suggests that conditions of moisture and temperature were favorable during each midwinter crop season for the initiation of the disease.

The season of 1944-45 was cool and rainfall was light but sclerotiniose developed in bean fields over most of the lower East Coast area. It was severe in fields where soil moistures remained high but was of only minor importance on drier soils. Losses during the season were moderate for the area as a whole.

Approximately the same temperatures were experienced in 1945-46 as in 1944-45, but rainfall was appreciably greater at Pompano and at Homestead. Sclerotiniose was severe during this season in all sections, causing losses that ranged from a trace to as much as 100 percent.

The season of 1946-47 was one of relatively high temperatures, and rainfall was above the four-year average. Sclerotiniose appeared in all sections at about the same time as in previous years but failed to develop appreciably thereafter. Losses during the season were very light.

Rainfall during the 1947-48 season was above average at Pompano and at Homestead, and temperatures were above 70° F. until January, when they fell below 70° F. Sclerotiniose appeared at approximately the same time as previously but failed to develop into epidemic proportions. During late January, following three weeks of cool weather and a series of light rains, appreciable sclerotiniose appeared in the Homestead area but did not become serious. A sudden rise in temperature to above 70° F. and a discontinuance of rains were apparently the limiting factors. No appreciable disease developed at Pompano. Losses for the season were light at each location.

Inferences

While the above observations are limited in scope and the weather data are not for a long enough period of years to warrant conclusions, certain trends are in evidence that will be of considerable value if verified by

additional findings. It appears that both temperature and moisture during the midwinter growing season were suitable for the initiation of sclerotiniose in south Florida during the past four years. Further spread and subsequent severity of the disease appeared to be limited by weather conditions following its first appearance.

During the 1944-45 season, apothecia were plentiful in many fields but only moderate disease losses were sustained. Since ample inoculum appeared to be present for heavy infections, a lack of adequate moisture probably limited the amount of disease. The season of 1945-46 was similar to 1944-45 with respect to numbers of apothecia and temperatures, but rainfall was appreciably greater and disease losses were severe. This suggests that moisture and temperature were suitable for severe disease incidence throughout the area.

Temperatures during the season of 1946-47 were high and rainfall was appreciably above the four-year average. Apothecia developed slowly and were considerably fewer in number than during the two previous years. Disease incidence was low and losses were very slight. These conditions suggest that temperature was possibly too high for best apothecial growth, inoculum was light, and, although moisture was high, little disease developed.

The season of 1947-48 was similar to 1946-47 from November until the last week in December, when mean temperature fell below 70° F. and remained below for approximately four weeks. No apothecia were found until January and then only in scattered locations. The only appreciable amount of sclerotiniose found during the season was noted during late January, and this outbreak failed to develop into serious proportions. The indication here is that temperatures early in the season were too high for good apothecial growth and inoculum was light. Temperatures were apparently suitable for apothecial growth in January and, following a series of light rains, some disease did appear. High temperature and low moisture early in February apparently stopped further progress of the disease.

While the above observations are of some interest at this time, they can not be evaluated upon the basis of weather alone. The number of sclerotia that live over from one season to another have a direct bearing upon the number of apothecia that appear during the winter regardless of temperature and rainfall. Summer rains, flooding, types of summer plowing, and chemical soil treatments are influential factors in the survival of viable sclerotia. Until all can be evaluated collectively weather influences must be accepted in terms of trends rather than definite, measurable relationships.

Reference.

1. Brooks, A. N. Control of Celery Pink Rot. Fla. Agr. Exp. Sta. Press. Bull. 567. 1942.

DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

POTATO LATE BLIGHT IN COLORADO

W. D. Thomas, Jr.

On July 8 scattered traces of late blight were found on Red McClure potatoes in the San Luis Valley. All infections were small foliage areas; no stem lesions were observed. One cull pile was located in the area in which one plant was found in which late blight was actively producing inoculum on stem lesions. The cull pile was found, incidentally, by means of spore trap exposures which have been used in Colorado for the past two years, and in Minnesota previously. At the time of discovery there was very little to be alarmed about as most of the growers had not started to row-irrigate.

On July 24 two large infection loci were found in experimental plots near Deerfield in Weld County. These plots were designed to determine the efficiency of overhead irrigation, a method which naturally creates conditions favorable for the development of late blight. However, these plots were sufficiently isolated from other potato fields by about 20 miles that no commercial fields were endangered.

The early crop in Weld County is being harvested now and has escaped the disease. As yet no late blight has been found in the late potatoes in that area.

COLORADO A & M COLLEGE, FORT COLLINS

PROGRESS REPORT ON LATE BLIGHT, TOBACCO BLUE MOLD, AND CUCURBIT DOWNY MILDEW

(Summarized from reports of Key Pathologists of the Crop Plant Disease Forecasting Service, received to the middle of August. NOTE -- Reports used in the preceding summary were received up to the middle of July, not June as stated in PDR, Aug. 15, p. 348).

LATE BLIGHT (*Phytophthora infestans*)

Distribution of late blight on potato and tomato as reported in the nothern part of the warning service area up to the middle of August is indicated on the maps (Figures 1 and 2). States and Provinces in which the disease appeared since the last progress report are distinguished by the x's showing counties.

TOBACCO BLUE MOLD (*Peronospora tabacina*)

In MASSACHUSETTS many growers failed to continue treatment throughout

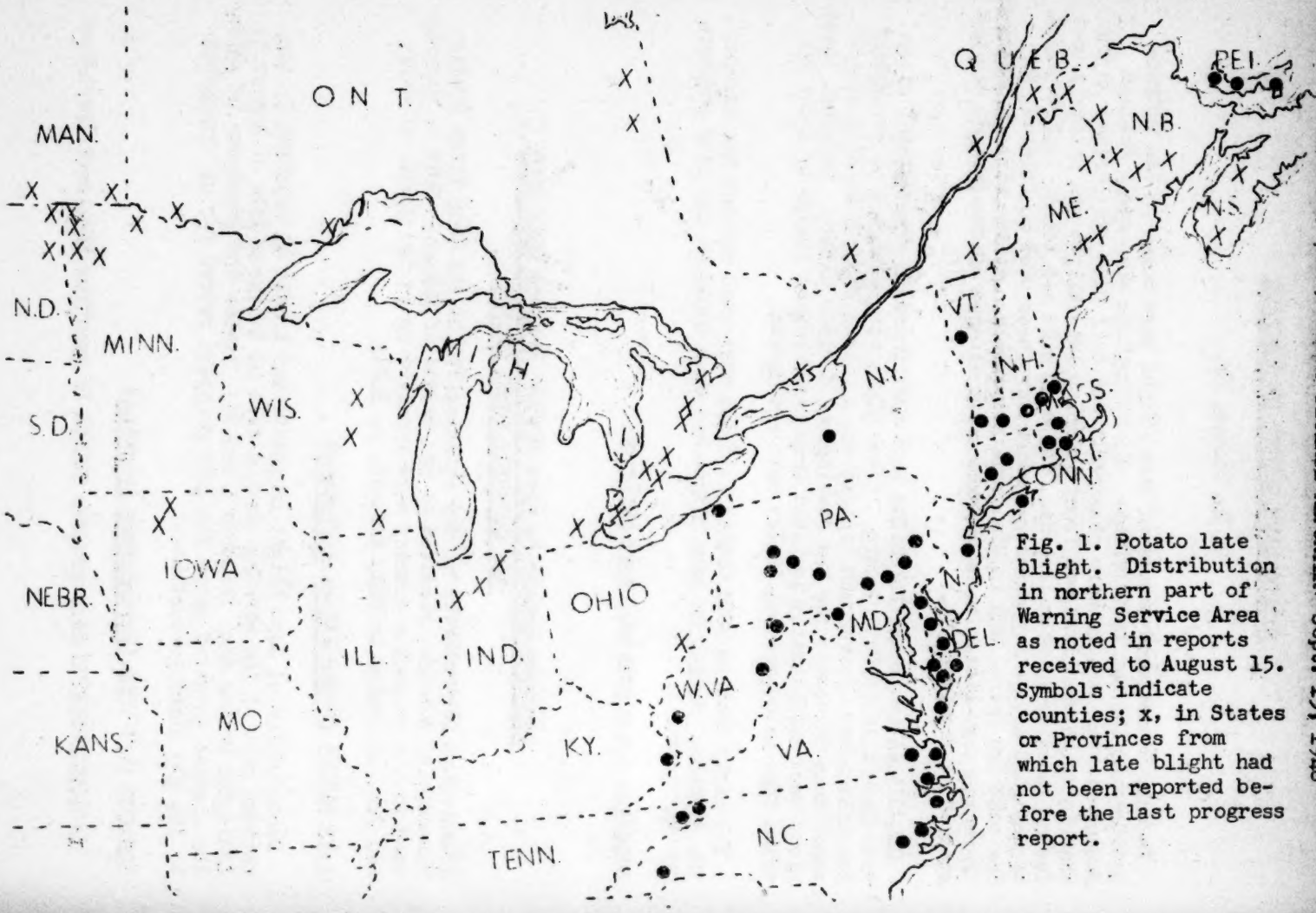

Fig. 1. Potato late blight. Distribution in northern part of Warning Service Area as noted in reports received to August 15. Symbols indicate counties; x, in States or Provinces from which late blight had not been reported before the last progress report.

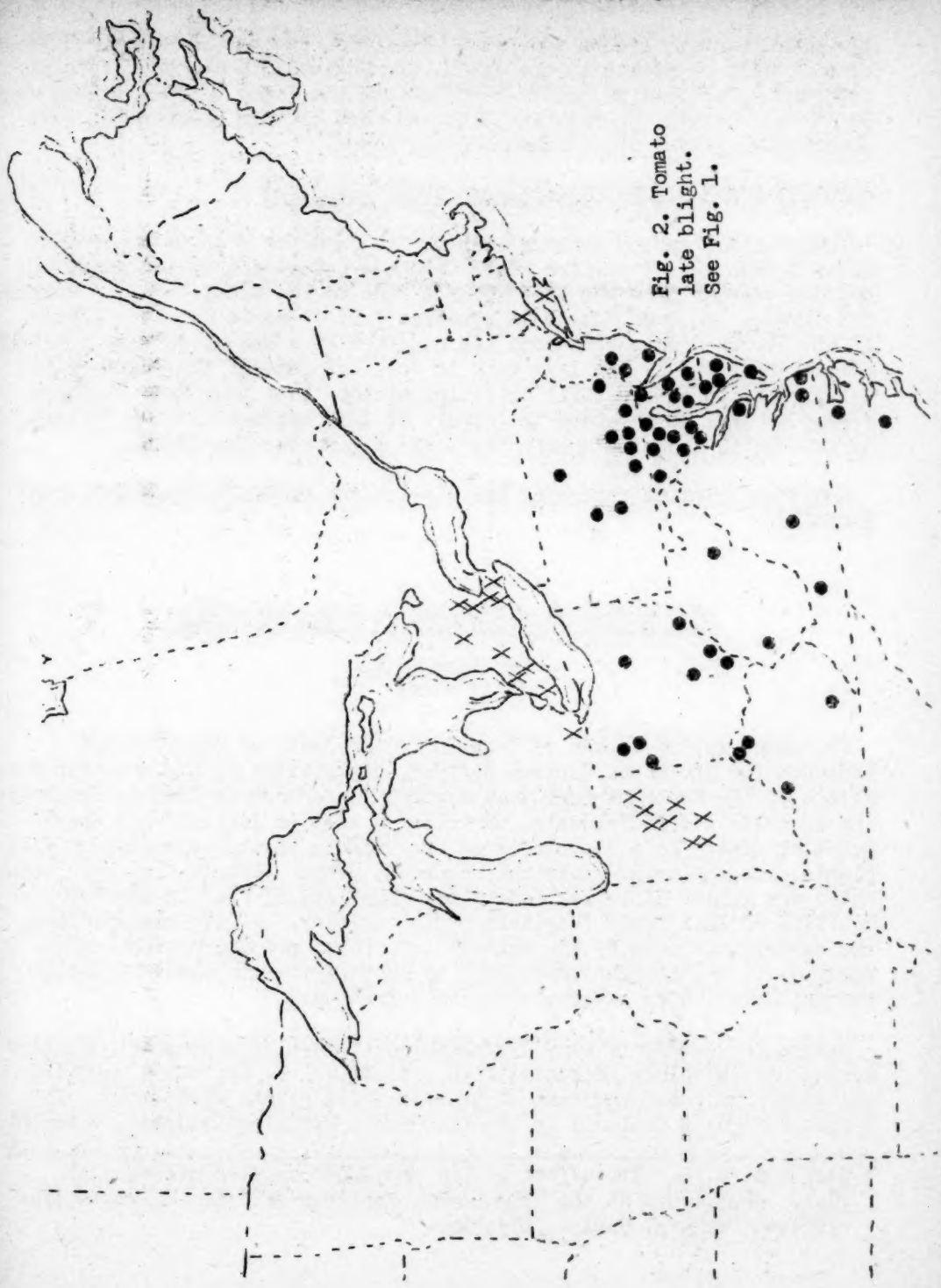

Fig. 2. Tomato late blight. See Fig. 1.

the transplanting season and, as in most past seasons, blue mold developed occasionally on plants in the field. An unusually late occurrence was reported in a field of Havana Seed tobacco set late. Infection was very active and heavily sporulating spots an inch or more in diameter were numerous on leaves about midway up the plant.

CUCURBIT DOWNY MILDEW (Pseudoperonospora cubensis)

Downy mildew caused serious loss on the cucumber crop in the south-central counties of eastern NORTH CAROLINA before the end of June, but hot dry weather from the last week in June to the middle of July checked the disease and development in counties farther north was less severe. In the Warren County cantaloup and cucumber area cucumbers were generally heavily infected by the last week in July but some of the cucumber receiving stations were still operating, whereas last year they had been forced to shut down before the middle of July because of downy mildew. Cantaloups in the area apparently would escape serious damage.

Additional States reporting the disease are VIRGINIA, MARYLAND, and DELAWARE.

THE EFFECT OF 2,4-D ON SOME DISEASES OF FLAX

W. E. Sackston

The mimeographed "Plans of Coordinated Projects of Weed Control Research for the North Central Region", distributed by the research committee of the North Central Weed Control Conference in 1948 to cooperating agencies and individuals, contained a section dealing with use of 2,4-D on flax. In a discussion on the effects of this chemical on flax plants, the following statement occurred: "Other factors that have been noted are fusion of leaves and bolls, sterility of florets AND PREDISPOSITION TO FLAX RUST" (Capitals by the writer). As the observations and experiments made by the writer[1] to date do not support this conclusion, it was thought worthwhile to present them in order to elicit comment from others interested in this problem.

During the summer of 1947 a replicated field-plot experiment was performed near Winnipeg in cooperation with Mr. J. S. Skaptason to study the effect on pasmo and rust of treating flax plants with 2,4-D. The 8 flax varieties included in the test were: Royal and Redwing, standard

[1] Sackston, W. E. The effect of DDT and 2,4-D on some diseases of flax. Abst. read at the June, 1948, meetings of Canadian Phytopathological Society, Guelph, Ontario.

varieties on the Canadian prairies; Bison, extremely susceptible to rust; Rocket, Dakota, and Sheyenne, immune from rust, and newly licensed for distribution in Canada; and Crystal and Viking, immune from rust, but differing in their reaction to pasmo. The flax was sown about the middle of June. An ester formulation of 2,4-D was applied at the rates of 0, 2 and 4 ounces of acid per acre on July 24. Six days later one-third of the plots were inoculated with pasmo (Septoria linicola (Speg.) Gar.), one-third were inoculated with rust (Melampsora lini (Pers.) Lév.), and one-third were left uninoculated.

Moderate 2,4-D injury was observed on the treated plots when final notes were taken on August 24. Typical pasmo symptoms were seen in all the pasmo-inoculated plots, with no apparent differences in the severity of the disease as a result of spraying with 2,4-D. Rust infection was "heavy" on all the rust-inoculated plots of Bison, "trace" on Redwing, and "scarce" on Royal. No rust was found on any of the other varieties in the test. There was no evidence of any effect on the development of rust infection as a result of spraying with 2,4-D.

In March of 1948 plants of Bison flax unintentionally exposed to the fumes of 2,4-D (ester formulation) in the greenhouse were made available to Mr. B. Peturson. The stems of the 6-week-old plants were twisted and some of the upper leaves were enlarged and fused. Inoculations were made on different groups of these plants with pasmo, rust, anthracnose (Colletotrichum lini Bolley) and stembreak (Polyspora lini Lafferty). A few spores of the respective pathogens were placed on the distorted leaves and on the apparently unaffected cotyledons of the test plants as well as on leaves of normal plants of the same variety. Additional inoculations were made with stembreak by stabbing the leaves with a needle covered with spores of P. lini. The inoculated plants were incubated in moist chambers for 48 hours. Half of each group of plants was then placed on an open bench in the greenhouse and the other half was placed in cubicles enclosed with glass to maintain high relative humidity. Symptoms developed with apparently equal intensity on both the distorted and normal leaves inoculated with pasmo, rust and anthracnose. Pasmo and anthracnose were more severe on the plants kept in the humid environment of the glassed-in cubicles. No infection resulted on any of the plants inoculated with P. lini. 2,4-D did not seem to affect the reaction of Bison flax to any of the pathogens studied.

In the course of a flax-disease survey made in Manitoba and the southeastern part of Saskatchewan between July 13 and July 20, 1948, several fields were seen in which various weeds and in some cases the flax plants showed evidence of 2,4-D injury. In no case was any disease recognized to be conspicuously more or less prevalent than in untreated fields in the same district. Additional observations will be made later in the season on flax plots included in 2,4-D experiments at the University of Manitoba, and on flax in farm fields in a late-season disease survey.

DOMINION LABORATORY OF PLANT PATHOLOGY, WINNIPEG, MANITOBA, CANADA

EFFECT OF SOIL APPLICATIONS OF "PARATHION" ON THE TOP GROWTH OF BLAKEMORE STRAWBERRY PLANTS

M. C. Goldsworthy and Roy A. Wilson

"Parathion", o, o-diethyl o-p-nitrophenyl thiophosphate, also known as "Thiophos 3422" and "3422", is being tested extensively as an insecticide for the control of certain pests of garden, field, and orchard crops.

The material is a high boiling deep brown to yellow liquid and may be formulated for field use, as an emulsion concentrate, as a dust, as a water-dispersible powder or as an aerosol. As a water-dispersible powder, containing approximately 25 percent of the active chemical, the material is being used experimentally on orchard, field, and garden crops.

Its use in repeated applications carries the implication of possible accumulation of "Parathion" in the soil and the experiments described in this note were designed to determine, whether or not, definite known increments mixed with soil would have any deleterious effects upon plant growth.

Strawberry plants (Blakemore variety) were used as test plants in a procedure similar to that already described in the study of the soil effects of the insecticidal chlorinated hydrocarbons[1]. "Parathion" was added to 80-pound lots of composted Sassafras sandy loam soil in such amounts that the final mixture was equivalent to concentrations of 0, 3, 6, 12, 25, 50 and 100 pounds respectively of "Parathion" (100%) per acre (based upon a 6-2/3 inch profile on 2,000,000 pounds of soil). Each treated lot of soil was distributed among 8 eight-inch pots and three 1-year old Blakemore strawberry plants were planted in each pot on March 5, 1948. The 56 pots (i.e., 8 replicates of each of the 7 treatments) were placed in a randomized arrangement on a greenhouse bench and the plants were harvested on May 14 at the end of 71 days. The nitrogen level of growth was maintained throughout the length of the test by the addition of ammonium nitrate occasionally to the soil and the insect pests were controlled by periodic fumigation of the house with hexaethyl pyrophosphate.

During the course of the test there was no evidence of any deleterious effect upon plant growth such as was noted in previous experiments with DDT.[1] In fact, as growth progressed, it became apparent that the plants in the "Parathion" treated soil were growing more vigorously than those in the untreated soil.

1 Goldsworthy, M. C. Effect of soil applications of various chlorinated hydrocarbons on the top growth of Blakemore strawberry plants. Plant Dis. Reptr. 32 (5): 186-188. May 15, 1948.

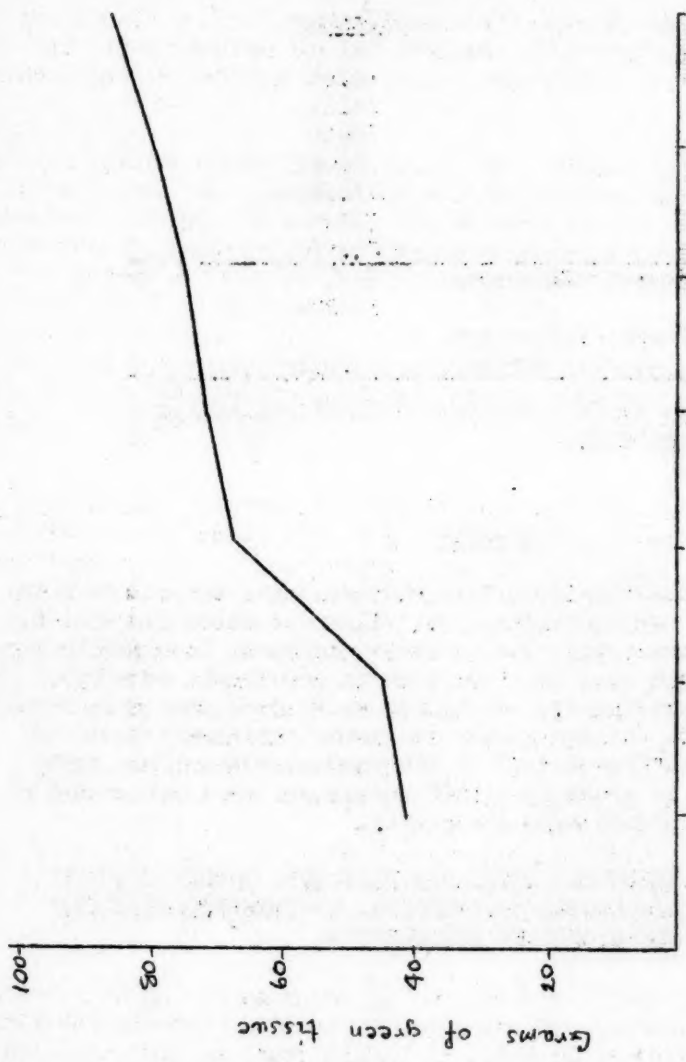

Figure 1. Effect of o,o-diethyl, o,p-nitrophenyl thiophosphate (Parathion), when added to Sassafras sandy loam, on the growth of potted Blakemore strawberry plants grown in the greenhouse.

Table 1. Effect of adding "Parathion" (o, o-diethyl o-p-nitrophenyl thiophosphate) to composted Sassafras sandy loam soil on the green weight of tops of Blakemore strawberry plants.

Concentration lb./acre	Average green weight of tops* Grams
0	40.5
3	44.1
6	66.0
12	70.6
25	74.1
50	78.5
100	84.5
Least Significant difference at 1%	12.20
Least Significant difference at 5%	9.03

*Averages are for 8 randomized 3-plant replicates for each treatment.

Results

Table 1 shows the concentrations used and the means derived from the various replicates at each concentration. Figure 1 shows the same data graphically. Growth was accelerated at every increase in concentration and at the highest level used this increase in growth was over twice that developed in the untreated soil. It is not known just what caused this acceleration of growth. As far as the Blakemore strawberry plant is concerned, additions of "Parathion" to the composted Sassafras sandy loam soil in which it is grown up to 100 pounds per acre appear not to cause any deleterious effect upon its growth.

DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES, BUREAU OF PLANT INDUSTRY, SOILS AND AGRICULTURAL ENGINEERING, AGRICULTURAL RESEARCH ADMINISTRATION, U. S. DEPARTMENT OF AGRICULTURE

VARIETAL REACTION OF OATS TO POWDERY MILDEW IN VIRGINIA

Curtis W. Roane

Powdery mildew (Erysiphe graminis) appears on oats each year in Virginia but it is not considered of economic importance. In 1948, several varieties were attacked in the oat yield test nurseries at different locations in the State and the nature of these outbreaks was such that the relative susceptibility of the varieties could be evaluated. Table 1 shows the severity of the disease on the spring varieties at the Shenandoah Valley Field Station, and the winter varieties at the Agronomy Farm at Blacksburg. The field reaction type may be considered as type 2, described by Mains and Dietz for barley mildew[1]. Those varieties which showed the heaviest mildew appeared to be losing their lower leaves to this disease. No cleistothecia were found and no attempt was made to determine the losses.

Table 1. The percentage of powdery mildew (Erysiphe graminis) infection on spring and winter oats at Staunton and Blacksburg, Virginia, respectively

Spring varieties[b]	Percentage of infection[a]	Winter varieties[c]	Percentage of infection[a]
Andrew	16	Columbia TBH	0
Benton	15	Forkedeer	Trace
Carroll	22	Lee Cold Proof	0
Cherokee	20	Lee-Victoria x Fulwin CI 4599	0
Clinton	34	Lee-Victoria x Fulwin CI 4600	Trace
Clinton 59	26	Lee-Victoria x Fulwin CI 4657	Trace
Columbia	18	Lemont	2
Fulghum	21	Letoria	0
Marion	22	Pioneer	0
Mohawk	32	Stanton	Trace
Neosho	20	Traveler	0
Orange 8-627	36	Victorgrain	0
Orange 11-730	14	VPI #1	0
Orange 33-717	15	Wintok	5
Ventura	22		
Vicland	8		
White Spring	26		
Zephyr	28		

[a] Severity is the estimated percentage of the total surface covered by mildew and is the average of five readings, one from each replicate.

[b] Spring varieties observed at Staunton, June 4, 1948, were in the boot stage.

[c] Winter varieties observed at Blacksburg, May 24, 1948, were in flower.

SECTION OF PLANT PATHOLOGY, VIRGINIA AGRICULTURAL EXPERIMENT STATION, BLACKSBURG, VIRGINIA

1 Mains, E. B. and S. M. Dietz. Physiologic forms of barley mildew, Erysiphe graminis hordei Marchal. Phytopath. 20: 229-239. 1930.

CEREAL DISEASE SITUATION IN EASTERN WASHINGTON THIS SEASON

Roderick Sprague

The extremely wet crop season of September 1947 to date has been beneficial to cereals in the usually semi-arid areas of eastern Washington but has caused serious erosion, drowning and disease problems in the Palouse region and adjacent areas where rainfall has been excessive. Some of the diseases which are important this year are as follows:

1. Cercosporella footrot (C. herpotrichoides) is widespread this year in winter wheat but somewhat spotted in the fields, often confined to swales or areas with lush grain. Such places are 100 percent fallen over, the heads small and yield reduced. Footrot was found in areas where it did not occur ten years ago. It was present in Klickitat, Yakima, Asotin, Whitman, Garfield, Walla Walla, Columbia, Spokane and Lincoln Counties, as far west, for instance, as Davenport, Walla Walla and (near) Mabton. On High Prairie it was virtually absent where it had formerly been serious because (1) the top soil has eroded heavily and footrot does not thrive in the white sub soil; (2) the formerly most heavily infested fields are now seeded mainly to alfalfa.

2. Dry land rootrot (Helminthosporium sativum) is widely scattered in the drier areas in winter wheat. In the Palouse region spot blotch, an unusual symptom for this area, is common. In the Horse Heaven country of Benton County dry land rootrot caused up to 15 percent loss in fields of winter wheat. Frost injury and rootrot were associated in sandy stretches adjacent to highways. Inquiry indicates that these sandy areas are piles of "blow" sand collected there during dry years. Wheat emerged early in these places and was far enough out of the boot to suffer from a late frost while the less-advanced main portion of the fields escaped frost injury. The heads of frost injured plants are typically partially blighted. In addition these plants all show severe Helminthosporium lesions.

Specimens have been sent in from other areas which show Helminthosporium lesions on the heads, leaves, nodes and internodes. Some of this material shows evidence of late frost injury but other material appears to be the result of attack of H. sativum during the abnormally wet season.

3. Take-all (Ophiobolus graminis). Extensive patches of very late season take-all have appeared in winter wheat recently in Whitman, Garfield, and Columbia Counties. There is little evidence of either extreme stunting or of white heads, the symptoms by which workers are generally able to recognize the disease. Rather, the culm bases are lightly blackened, the plants stiffly erect, the roots dead and the heads prematurely ripened. There is none of the extreme charring,

culm collapse and falling associated with Cercosporella. This is the first report of take-all in such large amounts in eastern Washington. We have had scattered reports in the past. The combination of erosion of top soil, leaching of nitrogen and the excess moisture has probably combined to bring on this late season attack. The growers and agronomists have had difficulty distinguishing Cercosporella, take-all and just plain drowned wheat. The latter is confined to clay areas in low places. Sometimes the water stood in these spots until mid-June. As a result the wheat is dead or has managed to reach a height of 8 to 18 inches with a mass of dead tillers surrounding one or two surviving culms.

4. Root browning (Pythium graminicola Subrm.). There was a large area of spring seeded wheat extending from about seven miles north of Dayton to the vicinity of Walla Walla, Wash., which was severely stunted by the root browning fungus. The symptoms showed unusually severe injury, even death of some seedlings. The plants failed to recover properly and when seen on June 22, the fields had large areas of poorly tillered plants with pale green foliage, and generally stunted growth. The combination of poor seed bed, heavy rains and leaching probably favored this attack. The loss in this area must be at least 300,000 bushels. It emphasizes the paradoxical nature of the year. For instance in the Ritzville area or even in the drier Connell sector, the fields extend for miles in all directions with 30-bushel wheat crops in sight and grain up to one's waist.

5. Snow mold. Observations by C. S. Holton disclose that snow mold due to Typhula idahoensis and T. itoana caused nearly 100 percent foliage kill in Douglas County and less severe loss east of that area. The wet weather favored recovery from the crowns, however, and fair yields are expected in most fields. Fields which were reseeded to spring wheat were not doing as well.

6. Leaf rust (Puccinia rubigo-vera). Leaf rust is severe in the Palouse and in all but the drier parts of central Washington. The fields in the Pullman-Colfax-Rosalia areas are red with leaf rust.

7. Stripe rust is severe in Orfed wheat, less serious in some other varieties.

8. Stinking smut (Tilletia spp.) C. S. Holton, to date, has found smut, including dwarf bunt, scattered and much less severe than average.

9. Leaf spots.

(a) Selenophoma donacis var. stomaticola (race 12) appeared in a wide area in the Palouse from Dusty east to Moscow and north to Rosalia. It causes a small circular ashy spot with a narrow surrounding border. This is the first report from the country. Varietal resistance was noted.

(b.) Septoria tritici was present in all but the driest parts of eastern Washington. These are the first reports from the region, except for one or two small collections made in former years. The spot was relatively abundant in the Palouse.

10. Powdery mildew (Erysiphe graminis) is very prevalent this year in the Palouse and in winter wheat in other areas except in the drier portions. In a survey with C. S. Holton mildew was found in great abundance from Pullman to Walla Walla and from Athena, Oreg. to Pendleton, Oreg. In some fields it was especially severe on wheat that had been sprayed with 2-4-D to control weeds.

DEPARTMENT OF PLANT PATHOLOGY, STATE COLLEGE OF WASHINGTON, PULLMAN

SEVERE WINTER INJURY TO EVERGREENS IN WISCONSIN

While a certain amount of winter injury is experienced in Wisconsin each year, never within the memories of some of our oldest nurserymen have we witnessed such a disastrous winter as was the 1947-48 one. A state-wide survey recently conducted by the Department reveals that hundreds of thousands of dollars damage has been suffered by nurserymen, forest and woodlot owners, and home owners throughout the entire state. The injury is prevalent not only in Wisconsin but throughout the Lake State Regions. Hardly a species of evergreens escaped the ravages of this winter catastrophe. Hemlock, Balsam, Juniper, and Arborvitae appeared to be hardest hit but even Scotch, White and Red pine were victims along with many species of Spruce. Jack pine and Black Hill spruce seem to have escaped with less injury than other evergreens. It has come to be generally recognized that during a relatively dry winter accompanied by many sunshiny days and high winds during the period when there is a very low rate of absorption from the cold soil, resulting in a lack of water to the needles, twigs, and branches, that death of the affected tissues results. Whenever the freezing injury is localized in sun-exposed surfaces, it is classed as "Winter Sunscald".

While all of the factors are not well understood, this burning it is generally agreed results from winter drying. Certain types of soils, the nature and direction of the slope, the nature of the root system, and other factors may predispose individual trees to this condition when other trees are not affected in the same locality. Individual trees right alongside of a badly injured one are frequently observed to escape with little or no injury. Some trees were killed outright and others so badly burned as to have little chance for salvage while most of them were only burned on the windward or sunny side. Shallow rooted species apparently are most likely to be damaged. None of the trees had an opportunity to mature and harden off in preparation to endure the

winter temperatures we have as they usually do because of the unusually warm month of October followed abruptly by severe cold weather.

In attempting to save a winter-injured tree or restore it to its healthy appearance by regaining its vigor several precautions should be noted. Too drastic pruning is inadvisable since additional harm may occur. It would be best to defer pruning until the buds begin to open when the dead wood can be easily distinguished from the living. A moderately pruned tree will recover much more quickly than one severely pruned or one not pruned at all. While it is impracticable to prune winter-injured needles of evergreens, as much dead wood should be removed as possible. The application of fertilizers following pruning will encourage the formation of new tissue if adequate moisture is maintained and thus enable the tree to better withstand summer conditions. Danger of winter injury to ornamental evergreens can be greatly reduced by making certain that the ground is thoroughly soaked with water before it freezes in the fall and by applying a mulch during the late fall to avoid deep freezing of the soil.

DIVISION OF ENTOMOLOGY, WISCONSIN DEPARTMENT OF AGRICULTURE, MADISON, WISCONSIN, April 23, 1948.

PLANT DISEASES NEWLY DISCOVERED IN VARIOUS LOCATIONS

FUSARIUM WILT OF CANTALOUP IN NEW JERSEY

By C. M. Haenseler

We have just come across a rather severe case of cantaloup Fusarium wilt near Egg Harbor, Atlantic County, New Jersey, which I believe is the first official report of this disease in the State. I have not yet seen the field but the grower brought in some excellent material showing typical stem lesions that were sporulating very heavily with a Fusarium. The same grower reported the same trouble last year but no specimens were available at the time and the disease could not be diagnosed from the description alone.
NEW JERSEY AGRICULTURAL EXPERIMENT STATION; NEW BRUNSWICK. July 27.

PECAN SCAB IN MARYLAND

By Carroll E. Cox

Pecan foliage showing symptoms of scab, Cladosporium effusum (Wint.) Demaree was sent to this laboratory on June 29 from Denton, Maryland by County Agent F. M. Rogers. The diagnosis was confirmed by J. B. Demaree. This disease apparently has not been observed in Maryland previously.
DIVISION OF PLANT PATHOLOGY, UNIVERSITY OF MARYLAND, COLLEGE PARK, July 19.

ASCOCHYTA LEAF SPOT ON SNAP BEAN IN WASHINGTON

By Roderick Sprague

A leaf spot on snap bean sent in from Issaquah, Washington, was caused by Ascochyta phaseolorum Sacc. I believe that this fungus is rarely reported. The spores are small, 3-10 x 18-24 microns, about 90 percent being one-septate, the remainder Phyllosticta-like, cylindrical to subfusoid, often bent. Pycnidia are globose, pale, ostiolate, 80 - 165 microns in diameter. The lesions are pale, almost straw color to light brown with a very narrow red border, angular to more or less circular and up to 1.5 cm. in diameter.

STATE COLLEGE OF WASHINGTON, PULLMAN, July 14.

BRIEF NOTES ON PLANT DISEASES, AND SOME CORRECTIONS

BLACK ROT OF CABBAGE IN MISSISSIPPI

By Douglas C. Bain

This note is in response to a request in the July 15 number of the Plant Disease Reporter. Outbreaks of cabbage black rot [Xanthomonas campestris] were both numerous and severe in the very early spring of the past two seasons - 1947 and 1948. There appeared to be some evidence of infection by soil-borne bacteria but observations strongly indicated that most of the outbreaks originated in plants grown from diseased seed. There was a considerable amount of spread to other fields which was due to carelessness and other factors. During the past two seasons the writer has urged the growers to practice one or more of the following recommendations:

1. Use of disease-free seed, or
2. Treatment of seed with $HgCl_2$ or hot water.
3. Two or more years rotation.
4. Roguing of diseased plants as soon as they show up.
5. Stay out of fields when plants are wet with dew or rain

TRUCK CROPS BRANCH STATION, CRYSTAL SPRINGS, MISSISSIPPI

STRAWBERRY ROOT ROT IN OREGON: A CORRECTION

By P. W. Miller

There is one error in my paper on "Studies on the Cause of Strawberry Root Rot in Oregon: Second Report of Progress" published in the July 15th issue of the Plant Disease Reporter.

On page 311, table 1, last column, the percentage figure for Phoma sp. is wrong. It should be 0.5%. The figure given--14.9%--should have been for Unidentified miscellany which should have appeared in the table just below Phoma sp.

DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

HISTORY AND DISTRIBUTION OF ROSE BLACK SPOT: A CORRECTION:

By Kenneth F. Baker

One serious and two minor typographical errors appear in the rose black spot paper (PDR 32(6): 260-274).

p. 260, line 27. Read Kickx for Kichx
p. 262, line 32. Read Americani for Americana
p. 265, line 6. Read Marssonina rosae (Lib.) Trail for Marssonina rosae Trail.

UNIVERSITY OF CALIFORNIA, COLLEGE OF AGRICULTURE, DIVISION OF PLANT PATHOLOGY, LOS ANGELES

HOST INDEX OF OKLAHOMA PLANT DISEASES, SUPPLEMENT, 1948

D. A. Preston

Introduction

This supplement contains, in the form of a host index, available information on the occurrence and distribution of 39 additional plant diseases recorded in Oklahoma since publication of two previous papers in this series: Oklahoma Agricultural Experiment Station Technical Bulletin No. T-21 Sept, 1945; and No. T-21 (Supplement), Oct., 1947. These 39 records, together with the 2,441 previously listed, bring the total number of plant diseases so far recorded in Oklahoma to 2,480.

HOST INDEX

AILANTHUS

A. ALTISSIMA (Mill.) Swingle, TREEOFHEAVEN AILANTHUS.
Diaporthe medusaea Nit., Canker; Woodward Co.
Schizophyllum commune Fr., Wound rot; Woodward Co.

ALTHAEA

A. ROSEA (L.) Cav., HOLLYHOCK
Macrophomina phaseoli (Maubl.) Ashby, Charcoal rot; Bryan Co.

AMPELOPSIS

A. CORDATA Michx., HEARTLEAF AMPELOPSIS
Plasmopara viticola (Berk. & Curt.) Berl. & DeToni., Downy mildew; Payne Co.

BOUTELOUA

B. HIRSUTA Lag., HAIRY GRAMA
Cercospora bouteloues Chupp & Greene, Leaf spot; Noble Co.

BUDDLEIA

B. SP., BUTTERFLY BUSH.
Sclerotium rolfsii Sacc., Southern blight; Bryan Co.

CHENOPODIUM

C. LEPTOPHYLLUM Nutt. ex S.Wats., SLIMLEAF GOOSEFOOT.
Peronospora effusa (Grev.) Rabh., Downy mildew; Woodward Co.

DAHLIA

D. SP., DAHLIA
Aecidium dahliae Syd., Rust; Tulsa Co. As far as the writer can determine, this is the first report of this rust in the United States, it being reported previously from Mexico.
Virus, Ringspot; Payne Co.
Virus, Stunt; Payne Co.

DELPHINIUM

D. SP., LARKSPUR
Sclerotium rolfsii Sacc., Southern blight; Payne Co.

DESMODIUM

D. DILLENII Darl., DILLEN TICKCLOVER
Uromyces hedysari-paniculati (Schw.) Farl., Rust; Payne Co.

FORSYTHIA

F. SP., FORSYTHIA
Phymatotrichum omnivorum (Shear) Dug., Texas root rot; Bryan Co.

GOSSYPIUM

G. HIRSUTUM L., UPLAND COTTON
Phyllosticta gossypina Ell. & G.Mart., Leaf spot; Payne Co.

HELIANTHUS

H. MAXIMILIANA Schrad., MAXIMILIAN SUNFLOWER
Puccinia helianthi Schw., Rust; Payne Co.
H. TUBEROSUS L., JERUSALEM ARTICHOKE SUNFLOWER
Coleosporium helianthi (Schw.) Arth., Rust; Oklahoma Co.

INDIGOFERA

I. LEPTOSEPALA Nutt., WESTERN INDIGO
Uromyces indigoferae Diet. & Holw., Rust; Roger Mills Co.

LACTUCA

L. SATIVA L., GARDEN LETTUCE
Virus, Big vein virus; Payne Co.

LEERSIA

L. VIRGINICA Willd., WHITEGRASS
Piricularia grisea (Cke.) Sacc., Leaf spot; Payne Co.

LESPEDEZA

L. VIOLACEA var. PRAIREA Mack. & Bush
Uromyces lespedezae-procumbentis (Schw.) Curt., Rust; Payne Co.

LOLIUM

L. PERENNE L., PERENNIAL RYEGRASS
Puccinia graminis var. avenae Erikss. & Henn., Stem rust; Payne Co.

MENISPERMUM

M. CANADENSE L., COMMON MOONSEED
Hendersonia sp., Dieback; Payne Co.

PANICUM

P. ANTIDOTALE Retz., BLUE PANICUM
Phyllosticta panici E. Young, Leaf spot; Payne Co.

PELARGONIUM

P. SP., GERANIUM
Virus, Mosaic; Payne Co.

QUERCUS

Q. SPP., OAK
Daedalea ambigua Berk., Wood rot; Cherokee Co.
Ganoderma sessile Murr., Wood rot; Payne Co.

RUELLIA

R. CILIOSA Pursh, FRINGELEAF RUELLIA
Cercospora consociata Wint., Leaf spot; Creek Co.

SETARIA

S. LUTESCENS (Weigel) F.T.Hubb., YELLOW BRISTLEGRASS
Puccinia substriata Ell. & Barth., Rust; Payne Co.

SOLANUM

S. MELONGENA L., GARDEN EGGPLANT
Virus, Yellows; Payne Co.

S. TUBEROSUM L., POTATO
Phytophthora erythroseptica Pethyb., Pink rot; Payne Co.
Phytophthora parasitica Dastur, Tuber rot; Payne Co.
Rhizoctonia crocorum (Pers.) DC. ex FR., Violet root rot.

STYLOSANTHES

S. BIFLORA (L.) B.S.P., PENCILFLOWER
Parodiella perisporioides (Berk. & Curt.) Speg., Black mildew; Pittsburg Co.

TAGETES

T. SP., MARIGOLD
Macrophomina phaseoli (Maubl.) Ashby, Charcoal rot.

TRIDENS

T. ELONGATUM Nash
Phyllachora eragrostidis Chardon, Tar spot; Creek Co.

VIGNA

V. SINENSIS (Torner) Hassk., COWPEA
Choenephora cucurbitarum (Berk. & Rav.) Thaxt., Pod rot; Carter Co.

VIOLA

V. SP., VIOLET
Sclerotium rolfsii Sacc., Southern blight; Payne Co.

VITIS

V. SP., GRAPE
Phymatotrichum omnivorum (Shear) Dug., Texas root rot; Bryan Co.

WEIGELIA

W. SP., WEIGELIA
Phymatotrichum omnivorum (Shear) Dug., Texas root rot; Bryan Co.

OKLAHOMA AGRICULTURAL EXPERIMENT STATION, STILLWATER

CHECK LIST REVISION

Freeman Weiss

JUNCACEAE

JUNCUS spp., RUSH. Numerous grasslike, mostly perennial herbs, occurring on plains, meadows, on waste ground throughout the U. S., predominantly in the north or at high altitudes; several are of significant forage value, some have long been used in basketry, many are useful to wildlife and in erosion control. Typical spp. of these uses: J. BALTICUS Willd., WIRE RUSH, "WIRE-GRASS" (1); J. EFFUSUS L., BOG R. (2); J. LESCURII Boland, SALT R. (3); J. TENUIS Willd., SLENDER R. (4); others (5).

Bifusella acuminata (Ell. & Ev.) Bonar & W.B.Cooke, on stems. Calif., Colo. (5)

Cercospora junci J.J.Davis, on leaves. Wis. (5).

Cintractia junci (Schw.) Trel., inflorescence smut. N.J. (2); Mass. to Va., Tex., and Wis. (4); Miss., N.Y., N.Car., Pa., Wis. (5)

Claviceps junci Adams, ergot. Wis. (5).

Didymella juncina (Berk. & Rav.) Sacc., on culms. S.Car. (5)

Discella tenuispora Cke. & Harkn., on stems. ?Ore. (1); Calif. (5)

Endodothella junci (Fr.) Theiss. & Syd., stem spot. Ga., Ohio (2); N.Y., Wis. (4); Iowa, Ore. (5)

Hendersonia spp., on dead stems. Calif. (3). Reported as H. culmicola Sacc., H. scirpicola Cke. & Harkn., and others; probably saprophytic. See also Leptosphaeria and Stagonospora.

Heteropatella alpina (Ell. & Ev.) W.B.Cooke, on stems. Calif. (5)

Leptosphaeria spp., on dead stems. Calif. (1); Ga., Miss. (5). Reported as L. albopunctata (West.) Sacc., L. caricinella Karst., L. juncina (Auers.) Sacc.; probably all saprophytic.

Leptothyrium juncinum Cke. & Harkn., on stems. Utah (1); Calif. (3)

Metasphaeria defodiens (Ell.) Sacc., on dead stems. N.J. (2); N.Y. (5)

Ophiobolus junci J.H.Miller & Burton, on stems. Ga. (2).

Phoma junci Preuss, on stems. N.Car., Va. (5)

Pleospora juncicola Ell. & Ev., on culms. Colo. (1)

Ramularia junci Pk., leaf spot. N.Y. (5). ? Cercospora junci J. J. Davis

Rhabdospora sp., stem spot. Mont. (1)

Tolyposporium junci (Schroet.) Wor., inflorescence smut. Ore. (5)

Trullula junci Cke. & Harkn., on stems. Calif. (3)

Urocystis junci Lagh., stem smut. Nev., Wyo. (1)

JUNCUS cont.

Uromyces junci (Desm.) L.Tul. (II,III), rust. N.Dak. to Kans., Calif., and Wash; Pa. (1); Calif., Ore. (3); Calif., Ida., Nev. (5). O and I on various Compositae.

U. junci-effusi Syd. (II,III). Mass. to Ala., and Mo. (2); Mont. to Calif. and Wash. (5). O and I unknown.

U. silphii [Burr.] Arth. (II,III). Me. to N.Car., Tex., and N. Dak.; Wash. (4); also on other spp. in this range and to Fla. and Calif.

LUZULA (JUNCACEAE)

LUZULA spp., WOODRUSH. Grasslike perennials occurring in woodlands and plains, mostly northern or at high altitudes; several are of significant forage value, are useful to wildlife, or may be grown for ground cover in wild gardens. L. CAMPESTRIS (L.) DC., COMMON W. (1), and L. PARVIFLORA Ehrh., MILLET W. (2) are typical; other spp. (3)

Cintractia luzulae (Sacc.) Clint., inflorescence smut. Ind. (1)

Puccinia obscura Schroet. (II,III), rust. Me. to Kans. and Wis. (1); Ida. (1,2); Ore., Wash. (2,3); Calif., N.Y., Wis. (3). O and I on Bellis perennis in Europe.

LABIATAE

AGASTACHE spp., GIANT-HYSSOP. American perennial herbs especially A. FOENICULUM (Pursh) O. Kuntze (1) on prairies, Minn. to Nebr. and westward; A. NEPETOIDES (L.) O. Kuntze (2) and A. SCROPHULARIIFOLIA (Willd.) O.Kuntze (3) from New England to Minn. and southward; A. URTICIFOLIA (Benth.) O.Kuntze (4) in the far West. All are useful to wildlife, sometimes locally important as honey plants.

Ascochyta lophanthi J.J.Davis, leaf and stem spot. Wis. (1,3)

Heteropatella alpina (Ell. & Ev.) W.B.Cooke, on stems. Ore. (4)

Peronospora lophanthi Farl., downy mildew. Ill., Iowa (2); Iowa, Wis. (3)

Phoma lophanthi Bub., on stems. Ohio (2)

Puccinia hyssopi Schw. (III), rust. N.Y. to Mo. and Iowa (2); Pa. to Ill. and Wis. (3)

Ramularia lophanthi Ell. & Ev., leaf spot. Calif. (3); Mont. (4)

Septoria lophanthi Wint., leaf spot. Ill., Mo., Ohio (2); Wis. (3)

Sphaerotheca humuli (DC.) Burr., powdery mildew. Wash. (4). Var. fuliginea (Schlecht.) Salm. Mo., Wis. (1); Utah, Wash. (4)

Mosaic -- unidentified virus. Ind. (3)

AJUGA (LABIATAE)

AJUGA REPTANS L., BUGLEWEED. Perennial herb of Europe, grown in rock gardens, and locally escaped.

Sclerotium rolfsii Sacc. (S. delphinii Welch), southern blight. Calif., Conn., Kans., N.J.

BLEPHILIA (LABIATAE)

BLEPHILIA CILIATA (L.) Raf. (1) and B. HIRSUTA (Pursh) Benth. (2). Perennial herbs of the Eastern and Central States.

Cercoseptoria blephiliae Greene, leaf spot. Wis. (1)
Puccinia menthae Pers. (O,I,II,III), rust. Ind., Md., Mich. (1); Ill., Ind., Iowa, Mo., Tenn., Wis. (2)
Septoria menthicola Sacc. & Letendre, leafspot. Wis. (1)

COLEUS (LABIATAE)

COLEUS BLUMEI Benth., COLEUS (1). Perennial herb of Java, cult. in many forms for ornamental foliage; also other spp. (2) of tropical Africa and Asia, similarly used.

Alternaria sp., leaf spot. N.J. (1)
Aphelenchoides fragariae (Ritz.-Bos) Christie, leaf nematode.
Badhamia panicea (Fr.) Rostr., slime mold. Kans. (1)
Botrytis cinerea Pers. ex Fr., leaf spot, stem rot. Alaska.
Heterodera marioni (Cornu) Goodey, root knot. Ala., Calif., Conn., Md., N.J., N.Y., Okla., Hawaii. (1,2)
Orobanche ramosa L., parasitic on roots. N.Y.
Phyllosticta sp. leaf spot. N.J.
Pythium spp., damping off, cutting rot. Calif, Md. P. debaryanum Hesse, P. splendens H. Braun, and P. vexans DBy. have been reported.
Rhizoctonia solani Kuehn, damping off. Fla., Ill., N.Y., Tex. (1,2)
Verticillium sp., wilt. Conn. (1)

Mosaic -- unidentified virus. Ill. (1,2)
Crinkle -- noninfectious leaf deformity attributed to genetic factors. Md.

COLLINSONIA (LABIATAE)

COLLINSONIA CANADENSIS L., CITRONELLA HORSEBALM, STONEROOT (1). Perennial herb of woodlands in the Eastern and South Central States, grown in wild gardens and used in pharmacy.

Dendryphiella interseminata (Berk. & Rav.) Bub. & Ranoj., on stems. N.Y.
Leptosphaeria collinsoniae Dearn. & House, on stems. N.Y.
? Phyllachora sp., black stem spot. Pa.
Spondylocladium tenellum Pk., on stems. N.Y.

CUNILA (LABIATAE)

CUNILA ORIGANOIDES (L.) Britton, DITTANY, STONEMINT. Low perennial of dry hills, N.Y. to Ga. and westward; sometimes grown in rock gardens.

Puccinia menthae Pers. (0,I,II,III), rust. N.Y. to Va., Ark. and Ill.
Septoria cunillae Tehon, leaf spot. Ill.

DRACOCEPHALUM (LABIATAE)

DRACOCEPHALUM PARVIFLORUM Nutt., AMERICAN DRAGONHEAD (1); other spp. (2). Annual to biennial, native herb (1) or mostly perennial herbs of Europe and Asia (2), grown for ornament.

Phyllosticta dracocephali Dearn. & Bisby, leaf spot. Tex. (1)
Peronospora sp., downy mildew. Reported as P. hedeomae Kell. & Swing. in Wis.; P. lophanthae Farl. var. moldavicae Dearn. & Barth. in Wyo. (1)
Septoria dracocephali Thuem., leaf spot. Tex., Wis. (1)
Sclerotium rolfsii Sacc., southern blight. Tex. (1); Ill. (2)

GALEOPSIS (LABIATAE)

GALEOPSIS TETRAHIT L., HEMP-NETTLE. Coarse annual of Europe, naturalized in the Northern States; a weed in cultivated ground.

Erysiphe cichoracearum DC. (E. galeopsidis DC.), powdery mildew. General.
Phyllosticta decidua Ell. & Kell., leaf spot. Wis.
Septoria galeopsidis West., leaf spot. N.Y., Vt.

HEDEOMA (LABIATAE)

HEDEOMA PULEGIOIDES (L.) Pers. (1), AMERICAN PENNYROYAL. Weedy annual of the Eastern and Central States and southward; used in pharmacy, also useful to wildlife. Other spp. (2)

Peronospora hedeomatis (hedeomae) Kell. & Swing., downy mildew. Kans., Wis. (2)
Puccinia menthae Pers. (0,I,II,III), rust. Ill., Me., Pa., R.I., Wis. (1); Ariz., Mont., N.Mex., Tex. (2)
Rhabdospora hedeomina (Pk.) Sacc., on stems. N.J., N.Y. (1); Tex. (2)
Septoria hedeomatis (hedeomae) Dearn. & House, leaf spot. N.Y. (1)

HYSSOPUS (LABIATAE)

HYSSOPUS OFFICINALIS L., HYSSOP. European perennial, grown for ornament and as a sweet-herb and sometimes escaped.

Heterodera marioni (Cornu) Goodey, root knot. Mich.

LAMIUM (LABIATAE)

LAMIUM AMPLEXICAULE L., DEAD-NETTLE, HENBIT. Annual or biennial herb of Europe, widely naturalized in the U.S.; a weed in cultivated ground but useful to wildlife.

Erysiphe cichoracearum DC., powdery mildew. Calif., Kans., Okla., S.Car.
Heterodera marioni (Cornu) Goodey, root knot. ? Fla.
Peronospora lamii A.Braun, downy mildew. Miss., N.Y., N.Car., Tex.
Rhizoctonia solani Kuehn, root rot. Tex.
Septoria lamii Pass., leaf spot. Okla.

Yellows -- virus (Chlorogenus callistephi var. californicus Holmes, Callistephus virus 1A K.M.Sm.) Calif.

LAVANDULA (LABIATAE)

LAVANDULA OFFICINALIS L., LAVENDER. Perennial herb or shrub of Mediterranean region, cult. as a sweet herb and for ornament.

Armillaria mellea Vahl ex Fr., root rot. Tex.
Heterodera marioni (Cornu) Goodey, root knot.
Septoria lavandulae Desm., leaf spot. Ohio, Okla.

LEONOTIS (LABIATAE)

LEONOTIS NEPETAEFOLIA (L.) R.Br., LIONS-EAR. Annual of the Gulf States and tropical America, sometimes grown for ornament.

Cercospora leonotidis Cke., leaf spot. La.
Phoma leonotidis Seaver, on stems. Virgin Is.
Puccinia leonotidis (P.Henn.) Arth. (0,I,II,III), rust. Fla., P.R., Virgin Is.

LEONURUS (LABIATAE)

LEONURUS CARDIACA L., MOTHERWORT. Perennial herb of Europe, widely naturalized in the U.S.; a minor honey plant and sometimes grown in wild gardens.

Ascochyta leonuri Ell. & Dearn., leaf spot. La.
Dinemasporium hispidulum (Schrad. ex Fr.) Curt., leaf spot. Tex.
Phyllosticta decidua Ell. & Kell., leaf spot. Ohio, Tex., Wis.
Septoria lamii Pass., leaf spot. Pa.

Mosaic -- unidentified virus. Ind.

LYCOPUS (LABIATAE)

LYCOPUS spp., BUGLEWEED, WATER-HOARHOUND. Perennial herbs of moist ground, widely distributed in the U.S., especially L. AMERICANUS Muhl. (1), other spp. (2); wildlife food plants.

Ascochyta lophanthi J.J.Davis, leaf spot. Wis. (1,2); Mass. (2)
Cercospora lycopi Ell. & Ev., leaf spot. La. (2)
Phyllosticta decidua Ell. & Kell., leaf spot. Okla. (1); Iowa, Wis. (2)
Puccinia angustata Pk. (0,I), rust. Me. to Md., Kans., and N.Dak. (1); also on other spp. in this range and south to Ala. II and III on Eriophorum and Scirpus spp.
Septoria lycopi Pass., leaf spot. Wis. (1,2)
Synchytrium cellulare J.J.Davis, leaf gall. Wis. (1,2)

MARRUBIUM (LABIATAE)

MARRUBIUM VULGARE L., HOARHOUND. European perennial, widely naturalized in the U.S.; grown as a sweet herb and used in pharmacy, a minor honey plant in Calif. and Tex.

MARRUBIUM cont.

Cercospora marrubii Tharp, leaf spot. Okla., Tex.
Coniothyrium marrubii Fairm., on stems. Calif.
Diplodia herbarum (Cda.) Lev., on stems. Tex.
Heterodera marioni (Cornu) Goodey, root knot. Ala.
Phoma lanuginis Fairm., on stems. N.Y., Tex.
Pleospora labiatarum (Cke. & Harkn.) Sacc., on stems. Calif.
Synchytrium marrubii Tobler, leaf gall. Tex.

MELISSA (LABIATAE)

MELISSA OFFICINALIS L., COMMON BALM, LEMON B. European perennial, cult. as a sweet herb and for ornament and locally naturalized; a minor honey plant.

Botrytis cinerea Pers. ex Fr., gray-mold blight. Alaska
Phyllosticta decidua Ell. & Kell., leaf spot. N.Y.

MENTHA (LABIATAE)

MENTHA ARVENSIS L., FIELD MINT (including var. CANADENSIS (L.) Briq. and var. PIPERASCENS Malinwand, JAPANESE F. M.) (1); M. PIPERITA L. (usually as var. OFFICINALIS Sole), PEPPERMINT (2); and M. SPICATA L. (M. viridis Hort.), SPEARMINT (3); other spp. (4). Aromatic perennial herbs, mostly of Old World origin but widely naturalized in the U.S.; grown commercially, especially (2) and (3) as sweet herbs and for oil used in flavoring; chiefly in Mich., Ind., Ore. and Wash.

Alternaria sp., stem canker (? secondary). Mich. (2,3)
Cercospora menthicola Tehon & Daniels, leaf spot. Ill., Tex. (1)
Erysiphe cichoracearum DC., powdery mildew. Colo., Iowa, Wash. (1); Utah (4)
E. polygoni DC. Tex. (1)
Fusarium sp., stem canker (? secondary). Mich., Wash. (2)
Heterodera marioni (Cornu) Goodey, root knot. (1) var. piperascens; (2)
Leptosphaeria substerilis Pk., on leaves. N.Y. (2)
Phyllosticta decidua Ell. & Kell., leaf spot. Occasional, Me. to Ohio, Iowa and Wis. (1,2,3,4).
Puccinia angustata Pk. var. typica Arth. (0,I), rust. Calif., Mont., S.Dak., Wis. (1). II and III on Scirpus and Eriophorum spp.
P. menthae Pers. (0,I,II,III). Eastern and Central States to Tex. and the Pacific Coast, commonly on (1) and (3), occasionally (2) and (4). Including the form sometimes distinguished as var. americana Pk.

MENTHA cont.

Ramularia menthicola Sacc., leaf spot. Calif., Me., Mont., Ore., Wash., Wis., Wyo. (1)
R. variata J.J.Davis, Wis. (1)
Septoria menthicola Sacc. & Letendre, leaf spot. Wis. (1)
Sphaceloma menthae Jenkins, anthracnose. Ind. (1,2,3,4), Mich. (2,3)
Sphaerotheca humuli (DC.) Burr., powdery mildew. Wash. (1)
Verticillium albo-atrum Reinke & Berth., wilt. Ind., Mich. (2,3); Ore. (2)

MICROMERIA (LABIATAE)

MICROMERIA CHAMISSONIS (Benth.) Greene, YERBA BUENA. Trailing perennial herb of Pacific Coast States, used in rock gardens.

Puccinia menthae Pers. (0,I,II,III), rust. Calif., Ida., Ore., Wash.

MONARDA (LABIATAE)

MONARDA spp., BEEBALM, HORSE-MINT, especially M. DIDYMA L., OSWEGO-TEA (1); M. FISTULOSA L., WILD BERGAMOT (2); M. PUNCTATA L., SPOTTED BEEBALM (3); other spp. (4). Perennial herbs of the Eastern (1), or Eastern and Central States and westward (2,3); grown for ornament especially (1) and (2), minor honey plants in the Prairie States.

Cercospora sp., leaf spot. Okla. (4)
Phyllosticta decidua Ell. & Kell., leaf spot. Nebr., Tex. (2); Okla., Tex., Wis. (3); Kans., Okla. (4)
P. monardae Ell. & Barth. Kans. (4).
Puccinia angustata Pk. (0,I), rust. Nebr., Wis. (2)
P. menthae Pers. (0,I,II,III). General from Me. to Miss., Tex. and Ida., especially on (2) and (3); occasional (1,4).
Ramularia brevipes Ell. & Ev., leaf spot. Tex. (2,3); Ala. (4)
R. variata J.J.Davis. Wis. (2)
Sclerotium rolfsii Sacc., southern blight. Tex. (2,3,4)
Synchytrium holwayi Farl., leaf gall. Iowa, Wis. (2,4)

Mosaic -- unidentified virus. Ind. (2)

MONARDELLA (LABIATAE)

MONARDELLA ODORATISSIMA Benth. (1); other spp. (2). Mostly perennial herbs of the far West, used in rock gardens.

MONARDELLA cont.

Phyllosticta monardellae W. B. Cooke, leaf spot. Calif. (1)
Placosphaeria shastensis Sprague & W. B. Cooke, on stems. Calif. (1)
Puccinia menthae Pers. (O,I,II,III), rust. Calif., Nev., Ore., Utah (1); Calif., N.Mex., Ore. (2). The form on these hosts is sometimes distinguished as P. monardellae Dudley & C. H. Thompson.

NEPETA (LABIATAE)

NEPETA CATARIA L., CATNIP (1). Old World perennial, widely naturalized in the U.S.; sometimes grown as a sweet herb; useful as a honey plant but often a weed. N. HEDERACEA (L.) Trev., GROUND-IVY (2). Creeping perennial of Eurasia, widely naturalized in the U.S., used as ground cover in shade.

Ascochyta nepetae J.J.Davis, leaf spot. Wis. (1)
Botrytis cinerea Pers. ex Fr., gray mold. Alaska (1)
Cercospora nepetae Tehon, leaf spot. Ill., Tex. (1)
Didymella catariae (Cke. & Ell.) Sacc., on stems. N.J., Ohio (1)
Fusarium sp., wilt. Ga. (1)
Phyllosticta decidua Ell. & Kell., leaf spot. Ohio (1); Ill., Ind., N.J., Wis. (2)
Pseudomonas tabacum (Wolf & Foster) Stapp, bacterial leaf spot. Wis. (1)
Rhizoctonia solani Kuehn, root rot. Tex. (1)
Sclerotium rolfsii Sacc., southern blight. Tex. (1)
Septoria alabamensis Atk., (nom. nud.), leaf spot. Ala. (2)
S. nepetae Ell. & Ev. Tex., Wis. (1)

Mosaic -- virus. In part unidentified, in part cucumber mosaic virus (Marmor cucumeris Holmes, Cucumis virus 1 K.M.Sm.). Ind., Iowa, Kans., Mich., Wis.

OCIMUM (LABIATAE)

OCIMUM BASILICUM L., BASIL (1); O. MICRANTHUM Willd., AMERICAN B. (2). Annual herbs of tropical Asia (1) or America (2); (1) is cult. as a sweet herb.

Heterodera marioni (Cornu) Goodey, root knot. ? Fla. (1)
Sphaerotheca humuli (DC.) Burr., powdery mildew. P.R. (2)

PHYSOSTEGIA (LABIATAE)

PHYSOSTEGIA VIRGINIANA (L.) Benth. (1), other spp. (2), FALSE DRAGON-HEAD. Perennial herbs of the Eastern and Southern States; (1) is cult. for ornament.

Mycosphaerella physostegiae W.A.Jenkins, leaf spot. Va. (1). Conidial stage: Cercospora physostegiae.
Plasmopara cephalophora J.J.Davis, downy mildew. Wis. (2)
Puccinia physostegiae Pk. & G.W.Clint. (III), rust. Ind., N.H., N.Y. (1); Mont., N.Y. (2)
Rhabdospora physostegiae Pk. (nom. nud.), on stems. N.Y. (1)
Sclerotinia sclerotiorum (Lib.) DBy., stem rot. Me. (1)
Sclerotium rolfsii Sacc., southern blight. Va. to Okla. and Kans. (1). The form sometimes distinguished as S. delphinii is reported also in Conn., N.J., N.Y. and Wis.
Septoria physostegia Ell. & Ev., leaf spot. Ill., Wis. (1)

PRUNELLA (LABIATAE)

PRUNELLA VULGARIS L., SELF-HEAL, HEAL-ALL. Perennial herb of Europe, widely naturalized in the U.S.; sometimes used for ground cover or grown for ornament, useful to wildlife.

Erysiphe cichoracearum DC., powdery mildew. Pa.
Gibberidea abundans (Dobroz.) Shear, tar spot. Me., Wash.
Linospora brunellae Ell. & Ev., leaf spot. Ida., Wash., Alaska
Phyllosticta brunellae Ell. & Ev., leaf spot. Tex., Wash.
Pythium palingenes Drechs. and P. polytylum Drechs., root necrosis. Va.
Ramularia brunellae Ell. & Ev., leaf spot. Ill., Ind., N.Y., Ohio, Tex., Va., Wis. R. brunellae Briard & Hariot has priority.
Sclerotium rolfsii Sacc., southern blight. Tex.
Septoria brunellae Ell. & Holw., leaf spot. General.
Sphaerotheca humuli (DC.) Burr., powdery mildew. Ill., Md., Miss. The var. fuliginea (Schlecht.) Salm. also reported in Ill., Ind., Miss., Wash., Wis.

PYCNANTHEMUM (LABIATAE)

PYCNANTHEMUM spp., MOUNTAIN-MINT, especially P. FLEXUOSUM (Walt.) B.S.P. (1), and P. VIRGINIANUM (L.) Dur. & Jack. (2); other spp. (3). Perennial herbs of the Eastern and Central States and southward, sometimes grown for ornament or as sweet herbs; (2) is locally important as a honey plant.

PYCNANTHEMUM cont.

Cercoseptoria blephiliae Greene, leaf spot. Wis. (2)
Cercosporella pycnanthemi Atk., leaf spot. Ala. (2)
Puccinia angustata Pk. (0,I), rust. Ind. (2)
P. menthae Pers. (0,I,II,III). Mass. to Va., Tex., and Iowa (1); to Ala. and N.Dak. (2,3); also Calif., Okla. (3)
Synchytrium cellulare J.J.Davis, leaf gall. Wis. (1)

SALVIA (LABIATAE)

SALVIA OFFICINALIS L., SAGE. Shrubby perennial of the Mediterranean region, cult. as a savory herb.

Cercospora salviicola Tharp, leaf spot. W.Va.
Rhizoctonia solani Kuehn, damping off, root rot. Conn., Ill.
Sclerotium rolfsii Sacc., southern blight. Ill.

SALVIA spp. Numerous, mostly perennial herbs or subshrubs, several native to the Southern and South Central States and Calif., many to Mexico and Central America; also from Europe and Africa. Various spp. are cult. for ornament; the native ones are minor or locally important honey plants. Representative spp.: S. AZUREA Lam. (also S. pitcheri Torr.) BLUE SAGE (1); S. COCCINEA Juss., TEXAS S. (2); S. GREGII A. Gray, AUTUMN S. (3); S. MELLIFERA Greene, BLACK S. (4); S. SPLENDENS Ker-Gawl, SCARLET S. (5); other spp. (6).

Aecidium subsimulans Arth. & Mains (0,I), rust. Ariz. (6)
Aphelenchoides fragariae (Ritz.-Boz) Christie, leaf nematode. Del. (1)
Cercospora salviicola Tharp, leaf spot. Okla. (1); Tex. (6)
Didymella ramonae Fairm., on stems. Calif. (6)
Erysiphe cichoracearum DC., powdery mildew. Calif. (6)
Heterodera marioni (Cornu) Goodey, root knot. Ariz., N.J. (6)
Mycosphaerella audibertiae Rehm, on stems. Calif. (6)
Peronospora swinglei Ell. & Kell., downy mildew. Kans. (6)
Phymatotrichum omnivorum (Shear) Dug., root rot. Tex. (3,5)
Puccinia ballotaeflorae Long (II,III), rust. Tex. (6). O and I unknown.
P. caulicola Tracy & Gall. (0,I,II,III). Iowa to Tex., N.Mex., and S.Dak. (on S. lanceolata Willd.); ? Tex. (3)
P. farinacea Long (0,I,II,III). Ala., Kans., Miss., Mo., Nebr., Okla. (1); Ariz., Tex. (6)
P. mellifera Diet.& Holw. (I,III). Calif. (4,6); Nev. (4)
P. impedita Arth. & Mains (0,II,III). P.R. (2,6); Virgin Is. (6)
P. salviicola Diet. & Holw. (0,I,II,III). Fla., Tex. (2); P.R. (6)
P. vertisepta Tracy & Gall. (0,I,III). Ariz., N.Mex. (6)

SALVIA cont.

Pythium debaryanum Hesse, damping off. Ohio (5)
Ramularia salviicola Tharp, leaf spot. Tex. (6)
Rhizoctonia solani Kuehn, root rot, damping off. Conn., Ill., N.J., Ohio (5)
Sclerotium bataticola Taub., charocal rot. S.Car. (6)
Septoria salviae-pratensis Pass., leaf spot. Hawaii (2)
Sphaeropsis salviae Hollos, ? stem rot. Miss. (6)
Volutella flexuosa Cke. & Ell., on leaves. N.J. (6)

Yellows -- virus (Chlorogenus callistephi var. californicus Holmes, Callistephus virus 1A K.M.Sm.) Calif. (1)

SATUREIA (LABIATAE)

SATUREIA VULGARIS (L.) Fritsch., BASIL WEED (1). Perennial herb of woodlands ranging from Me. to N.Car. and west to the Rocky Mts. Other spp. (2) are cultivated for ornament or as sweet herbs and locally naturalized in the East.

Phyllosticta decidua Ell. & Kell., leaf spot. N.Y.
Puccinia menthae Pers. (0,I,II,III), rust. Mass. to Va., Colo., and Wis.

SCUTELLARIA (LABIATAE)

SCUTELLARIA spp., SKULLCAP. Native, mostly perennial herbs widely distributed in the Eastern and Central States, as S. GALERICULATA L. (1) and S. LATERIFLORA L. (2), wildlife food plants; other spp. (3), native or introduced, sometimes grown for ornament.

Botrytis cinerea Pers. ex Fr., stem rot. Wash. (3)
Cercospora scutellariae Ell. & Ev., leaf spot. Ill., Miss., Mo., Tex. (3)
Erysiphe galeopsidis DC. (= E. cichoracearum DC. ?), powdery mildew. Mich., N.Y., Wis. (1,2,3); Ill., Ind., Iowa, Kans., Ohio (2)
Microsphaera sp., powdery mildew. Ill. (2)
Phyllosticta decidua Ell. & Kell., leaf spot. Wis. (2); Tex. (3)
Phymatotrichum omnivorum (Shear) Dug., root rot. Tex. (3)
Rhizoctonia solani Kuehn, root rot. Tex. (3)
Septoria scutellariae Thuem., leaf spot. Me. to Iowa and Wis. (1,2); this range and also Calif., Colo., Miss., Okla. (3)

SPHACELE (LABIATAE)

SPHACELE CALYCINA Benth., PITCHER-SAGE. Shrubby herb of Calif., sometimes grown for ornament.

Hendersonia varians Cke. & Harkn., on stems. Calif.
Uredo sphacelicola Diet. & Holw. (II), rust. Calif.

STACHYS (LABIATAE)

STACHYS spp., BETONY, HEDGE-NETTLE. Mostly native perennial herbs as S. CILIATA Dougl. (1), S. PALUSTRIS L. (2), S. TENUIFOLIA Willd. (3), and other spp. (4); wildlife food plants, some of ornamental value.

Cercospora stachydis Ell. & Ev., leaf spot. Iowa, Me. (2)
Cylindrosporium stachydis Ell., leaf spot. Ill. (2)
Erysiphe galeopsidis DC. (= E. cichoracearum DC. ?), powdery mildew. Wash. (1); Ohio to Colo. and Mont. (2); N.Y. to Ind. and Wis. (3); this range and also N.Car., N.Mex., Tex. (4)
Heterodera marioni (Cornu) Goodey, root knot. Hawaii (4)
Ovularia bullata Ell. & Ev., leaf spot. Calif. (4)
O. stachydis-ciliatae Pk., Wash. (1)
Phyllosticta decidua Ell. & Kell., leaf spot. Mass. (2); Wis. (2,3)
P. palustris Ell. & Dearn. Ill., Ohio (2)
Puccinia pallidissima Speg. (III), rust. Tex. (4)
Ramularia stachydis (Pass.) Massal., leaf spot. Ore. (1)
Septoria stachydis Rob. in Desm., leaf spot. Ill., Miss., Wis. (2); N.Y. (3); Calif. (4)
Sphaerotheca humuli (DC.) Burr., powdery mildew. Calif. (4)
Synchytrium stachydis (stachyii) Cook, leaf gall. La. (4)

Spotted wilt -- virus (Lethum australiense Holmes, Lycopersicon virus 1 K.M.Sm.) Hawaii (4)

TEUCRIUM (LABIATAE)

TEUCRIUM CANADENSE L., AMERICAN GERMANDER (1). Perennial herb of woodlands in the Eastern and Central States; sometimes grown in wild gardens.

Cercospora teucrii (Schw.) Ell. & Kell. (C. racemosa Ell. & Martin), leaf spot. N.Y. to Miss., Tex., and Wis.
Erysiphe cichoracearum DC. (E. galeopsidis DC.), powdery mildew. Ill., Pa., Wis.

TEUCRIUM cont.
Peronospora sp., downy mildew. Okla.
Phyllosticta decidua Ell. & Kell., leaf spot. Tex., Wis.
Puccinia menthae Pers. (0,I,II,III), rust. Pa.

THYMUS (LABIATAE)

THYMUS SERPYLLUM L., MOTHER-OF-THYME, WILD T. (1). Prostrate woody herb of the Mediterranean region, naturalized in the Northeast; grown in herb gardens and a minor honey plant. T. VULGARIS L., COMMON T. (2) is similarly cultivated.

Botrytis cinerea Pers. ex Fr., gray mold. Alaska (2)
Mycosphaerella pachyasca (Rostr.) Vest., on leaves and stems. Alaska (1)
Rhizoctonia solani Kuehn, root rot. Mass. (2)

TRICHOSTEMA (LABIATAE)

TRICHOSTEMA DICHOTOMUM L., BLUE-CURLS. Annual herb of the Eastern and South Central States; sometimes grown in wild gardens.

Septoria trichostematis Pk., leaf spot. N.Y.

MENTZELIA (LOASCACEAE)

MENTZELIA spp., BLAZING-STAR, as M. DECAPETALA (Pursh) Urban & Gilg (1), M. FLORIDANA Nutt. (2), M. LAEVICAULIS Torr. & Gray (3), and others (4). Mostly perennial, sometimes woody, herbs of the Western and Southwestern States, (2) also in Fla., often grown for ornament.

Diplodina stevensii Sacc. (nom. nud.), on stems. N.Dak. (1)
Phyllosticta mentzeliae Ell. & Kell., leaf spot. Kans., Tex. (4)
Phymatotrichum omnivorum (Shear) Dug., root rot. Tex. (3,4)
Puccinia aristidae Tracy (0,I), rust. Ariz., Colo. (4). II and III on Aristida and Distichlis.
Rhizoctonia solani Kuehn, root and stem rot. N.J.
Septoria mentzeliae Ell. & Kell., leaf spot. Kans. (1); Wash. (3); Kans., Tex. (4)
Uredo floridana Syd. (II), rust. Fla. (2)

LOBELIACEAE

LOBELIA

LOBELIA spp. (native), as L. CARDINALIS L., CARDINAL FLOWER (1); L. INFLATA L., INDIAN-TOBACCO (2); L. SIPHILITICA L., BLUE LOBELIA (3); other spp. (4). Perennial (1,3) or annual (2) herbs of the Eastern and Central States and southward; some are cult. for ornament (1,3); several are useful to wildlife; (2) is sometimes a weed in cultivated ground.

Cercospora lobeliae Kell. & Swing., leaf spot. Ind., Kans., Tex. (3); Ala, Tex. (4); ? Ill. (1); ? Ind., Md., Tex. (2)

C. lobeliicola (lobeliaecola) Solheim, Kans., Tenn., Tex. (1); ? Tex., Va. (2); Ill., Iowa, Tex., Va., Wis. (3); Pa. (4). This has been reported as C. effusa (Berk. & Curt.) Ell. & Ev. and has been much confused with the preceding.

Colletotrichum lobeliae F.L. Stevens, P.R. (4)

Entyloma lobeliae Farl., leaf smut. Me. to Pa., Mo., and Wis. (2); Pa., P.R. (4).

Gloeosporium hawaiense Thuem., leaf spot. Hawaii (4)

Heterodera marioni (Cornu) Goodey, root knot. N.Y. (1); Nebr. (4)

Phyllosticta bridgesii Speg., leaf spot. Ind. (3)

Phymatotrichum omnivorum (Shear) Dug., root rot. Tex. (2,3,4)

Puccinia lobeliae Gerard (III), rust. Mich. (1); N.Y. to Va., Ark., and Wis. (3); this range and also N.Car., Tex. and Wash. (4)

Rhizoctonia solani Kuehn, root rot. N.Y., Ohio

Sclerotium delphinii Welch, stem rot. N. J.

Septoria lobeliae Pk., leaf spot. Occasional on all spp., from Me. to Va., Tex., and Wis. A form identified as S. lobeliae-syphiliticae P.Henn. also is reported in N.Y. (3)

Curly top -- virus (Chlorogenus eutetticola Holmes, Beta virus 1 K.M.Sm.). Tex. (1,4)

Spotted wilt -- virus (Lethum australiense Holmes, Lycopersicon virus 3 K.M.Sm.). Tex. (1,4)

LOBELIA spp. (introduced), as L. ERINUS L., EDGING LOBELIA (1); other spp. (2). Annual herb of S.Africa (1) and other introduced spp. (2), mostly Mexican, grown for ornament.

Amazonia asterinoides (Wint.) Theiss., black mildew. Hawaii (2)

Asterina fimbriata Kalchb. & Cke., and A. lobeliae F.L. Stevens & Ryan, black mildew. Hawaii (2)

Botrytis cinerea Pers. ex Fr., gray mold.

Calothyriopeltis metrosideri F.L.Stevens & Ryan, black mildew. Hawaii (2)

LOBELIA cont.

Heterodera marioni (Cornu)Goodey, root knot. ? Fla., Md.
Pythium debaryanum Hesse, damping off. Mass., N.Y. (1,2)

LYTHRACEAE

CUPHEA

CUPHEA PETIOLATA (L.) Koehne, WAXWEED (1). Annual herb of the Eastern and South Central States, useful to wildlife. C. PLATYCENTRA Lem., CIGAR-FLOWER (2). Mexican annual, grown under glass for ornament.

Botrytis cinerea Pers. ex Fr., gray mold. Occasional in greenhouses (2)
Erysiphe polygoni DC., powdery mildew. Md., Va. (1)
Heterodera marioni (Cornu) Goodey, root knot. Md. (2)
Rhizoctonia solani Kuehn, root rot. Ill. (2)
Septoria maculifera Sacc., leaf spot. N.Y., Pa., Va., W.Va. (1)
Uredo cupheae P.Henn. (II), rust. P.R. (1)

DECODON (LYTHRACEAE)

DECODON VERTICILLATUS (L.) Ell., WATER-WILLOW. Perennial herb of swamps and ponds in the Eastern and Central States and southward; a wildlife food plant.

Cercospora nesaeae Ell. & Ev., leaf spot. Del., N.J. C. decodontis Tehon & Daniels, reported in Ill., is doubtfully distinct.
Phyllosticta nesaeae Pk., leaf spot. N.J., N.Y., Ohio, Vt.
Puccinia minutissima Arth. (0,I), rust. Mass. to N.J., Ind., and Wis.; also Fla. II and III on Carex spp.

LAGERSTROEMIA INDICA L. See PDR 25: 306. 1941.

LYTHRUM (LYTHRACEAE)

LYTHRUM spp., LOOSESTRIFE, as L. ALATUM Pursh, WINGED L. (1); L. SALICARIA L., PURPLE L. (2); other spp. (3). Mostly perennial herbs, native (1) or widely naturalized (2) in the Eastern and Central States; grown in wild gardens and useful to wildlife; (2) is a minor honey plant.

Cercospora lythri (West) Niessl, leaf spot. Wis. (1)
? Mycosphaerella lythracearum Wolf, leaf spot. Miss. (3)
Pezizella oenotherae (Cke. & Ell.) Sacc., leaf spot. N.Y. (2), Mich. (3)

LYTHRUM cont.

Rhizoctonia solani Kuehn, root rot. Ill.
Septoria lythrina Pk., leaf spot. Kans., N.Y., (1,2); Wis. (1)
Synchytrium lythrii Cook, leaf gall. La. (1)

MARANTACEAE

CALATHEA

CALATHEA spp., MARANTA of florists, in part. Perennial herbs of tropical America, grown for ornament in greenhouses.

Glomerella cincta (Berk. & Curt.) Spauld & Schrenk (= G. cingulata ?) leaf spot. N.J.
Phyllosticta sp., leaf spot. N.J.
Puccinia cannae (Wint.) P.Henn. (II,III), rust. Canal Zone, P.R. O and I unknown.

MARANTA (MARANTACEAE)

MARANTA ARUNDINACEA L., ARROWROOT (1). Tropical American herb, cult. for starchy roots, one source of tapioca, also for ornament. Other spp. (2)

Glomerella cingulata (Ston.) Spauld & Schrenk, leaf spot. Md., N.J. (1,2)
Phyllosticta marantaceae P.Henn., leaf spot. Hawaii (2)
Puccinia cannae (Wint.) P.Henn. (II,III), rust. Fla. (1)

THALIA (MARANTACEAE)

THALIA DEALBATA Roscoe (1); T. GENICULATA L. (2). Tall perennial herbs of marshes of the Gulf States (1), tropical America (2); wildlife food plants.

Cercospora thaliae Ell. & Langl., leaf spot. La. (1)
Puccinia cannae (Wint.) P.Henn. (II,III), rust. Fla., P.R. (2). Host is perhaps T. divaricata Chapm.

MARTYNIACEAE

PROBOSCIDEA

PROBOSCIDEA JUSSIEUI Steud. (Martynia louisiana Mill.), UNICORN-PLANT, DEVILS-CLAW. Annual herb of the Gulf and Central States, sometimes cult. for ornament or the fruits which are used in preserves; a wildlife food plant.

PROBOSCIDEA cont.

Cercospora beticola Sacc., leaf spot. Iowa, Tex., Wis.; ? Kans.
Phymatotrichum omnivorum (Shear) Dug., root rot. Tex.
Pseudomonas martyneae (Elliott) Stapp, bacterial leaf spot. Kans.
Sclerotinia sclerotiorum (Lib.) DBy., stem rot. Mass.
Sclerotium rolfsii Sacc., southern blight. Tex.

Mosaic -- virus. In part cucumber mosaic virus (Marmor cucumeris Holmes, Cucumis virus 1 K.M.Sm.); perhaps also tobacco mosaic virus (Marmor tabaci Holmes, Nicotiana virus 1 K.M.Sm.). Iowa, Wis.

MELASTOMACEAE[1]

RHEXIA

RHEXIA spp., MEADOW-BEAUTY. Perennial herbs of the Eastern and Southern States, cult. for ornament.

Cercospora erythrogena Atk., leaf spot. Ala., Del., Miss., Tenn.
Colletotrichum rhexiae Ell. & Ev., leaf spot. Del.
Phyllosticta rhexiae Dearn. & House, leaf spot. Fla.

TIBOUCHINA (MELASTOMACEAE)

TIBOUCHINA SEMIDECANDRA Cogn., GLORY-BUSH. Shrub of Brazil, grown in the far South for ornament.

Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Fla.

MORACEAE[2]

CANNABIS

CANNABIS SATIVA L., HEMP. Tall annual of temperate Asia, extensively grown for fiber and sometimes for ornament or plant cover, commercial production chiefly in Ky., Minn., Iowa, Ill. and Wis.; also naturalized in the Eastern and Central States, a wildlife food plant.

Botryosphaeria marconii (Cav.) Charles & Jenkins, stem canker, wilt. Md., Va.
Botrytis cinerea Pers. ex Fr., gray mold. Ore., Va.

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[1] See PDR 25: 394 for MELASTOMA; PDR 25: 397 for MICONIA.
[2] For arborescent genera of this family see PDR vol. 24 and 25, 1940-41.

CANNABIS cont.

Cylindrosporium sp., leaf spot. Md.
Fusarium sp., canker, stem rot. Ill., Ind., Va., Wis. Conidial stage of the following.
Gibberella quinqueseptata Sherb. (nom. nud., ? G. saubinetii (Mont.) Sacc.) stem rot. Ind., Va.
Heterodera marioni (Cornu) Goodey, root knot. Tenn.
Hypomyces cancri (Rutgers) Wr., on roots, ? root rot. Md.
Orobanche ramosa L., broom rape, parasitic on roots. Calif., Ill., Ky., Wis.
Phomopsis ? cannabina Cursi, on stems. Ill.
Phymatotrichum omnivorum (Shear) Dug., root rot. Ariz., Tex.
Sclerotinia sclerotiorum (Lib.) DBy., stem rot, wilt. Mont.
Sclerotium bataticola Taub., charcoal rot. Ill.
S. rolfsii Sacc., southern blight. S.Car., Tex.
Septoria cannabis (Lasch) Sacc., leaf spot. Md. to Ky., Iowa, and Minn.; Fla., Tex.

HUMULUS (MORACEAE)

HUMULUS LUPULUS L., COMMON HOP (1). Perennial vine of Europe, grown for "cones" used in brewing, also for ornament and plant cover; commercial cultivation chiefly in Ore., Calif., Wash.; also naturalized in the Northeastern and North Central States. H. AMERICANUS Nutt., AMERICAN H. (2), perhaps a geographic race of the preceding, is endemic in the Central and Western States. H. JAPONICUS Sieb. & Zucc., JAPANESE H. (3), an annual vine of China and Japan, is grown for plant cover and is locally naturalized.

Aecidium sp., rust. Wash. (1)
Agrobacterium tumefaciens (E.F.Sm. & Town.) Conn, crown gall. Calif., Okla., Ore., Wash. (1)
Armillaria mellea Vahl ex Fr., root rot. Ore. (1)
Cercospora sp., leaf spot. Nebr. (1)
Ceriospora dubyi Niessl, on stems. N.Mex. (2)
Colletotrichum sp., anthracnose. See Glomerella cingulata.
Cylindrosporium humuli Ell. & Ev., leaf spot. N.Y. to N.Car., Iowa, and Wis. (1)
Erysiphe cichoracearum DC., powdery mildew. N.Y., Utah (1)
Fumago vagans Pers. ex Sacc., sooty mold (on cones). Calif., Ore., Wash. (1)
Glomerella cingulata (Ston.) Spauld. & Schrenk., anthracnose, leaf spot. Ind., Kans., Md., N.Y., Ore., Wash., Wis. (1)
Heterodera marioni (Cornu) Goodey, root knot. Calif. (1)
Mycosphaerella erysiphina (Berk. & Br.) leaf spot. Calif. (1)
Phyllosticta decidua Ell. & Kell., leaf spot. Iowa, Wis. (1)

HUMULUS cont.

P. humuli Sacc. & Speg., leaf spot. Iowa, Mass., Mich. (1). Var. major Ell. & Ev. is also reported in Iowa (1)
Pseudoperonospora humuli (Miy. & Tak.) G.W.Wils., downy mildew. Calif., N.Y., Ore., Wash., Wis. (1,2)
Septoria humuli West., leaf spot. N.H.
S. lupulina Ell. & Kell. Kans.
Sphaerotheca humuli (DC.) Burr., powdery mildew. General (1,2,3). Var. fuliginea (Schlecht.) Salm. is also reported in Minn.
Stagonospora humuli-americani Fairm., N.Mex. (2)
Verticillium albo-atrum Reinke & Berth., wilt. Me., Ohio, Ore., Wis. (1)

Mosaic -- unidentified virus, perhaps Humulus virus 1 K.M.Sm. N.Y., Ore., Wash. Several other suspected virus diseases of hop have been reported under various names, as chlorosis, ring-spot, "sleepers," split leaf, and yellow fleck, but their virus nature and relationships have not been confirmed.

MUSACEAE[3]

HELICONIA

HELICONIA BIHAI L., WILD PLANTAIN, BALISIER (1); other spp. (2). Robust perennial herbs of tropical America, grown for ornamental foliage, the juvenile forms in greenhouses.

Meliola heliconiae F.L.Stevens and M. musae (G.Kunze) Mont., black mildew. Canal Zone (2)
Metasphaeria sp. (? heliconiae Frag. & Cif.), leaf spot. Canal Zone.
Puccinia heliconiae (Diet.) Arth. (II,III), rust. Canal Zone (1,2); P.R. (2)

NYCTAGINACEAE

ABRONIA

ABRONIA spp., SAND-VERBENA. Annual or perennial herbs of sandy plains in the Western and Southwestern States; some are useful to wildlife.

Heterosporium abroniae Harkn., leaf spot. Calif., Tex.
Peronospora oxybaphi Ell. & Kell., downy mildew. Tex.
Puccinia aristidae Tracy (0,I), rust. Ariz., Calif., Colo., N.Mex. II and III on Aristida and Distichlis spp.

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[3] For Musa see PDR 25: 401-402. 1941.

ALLIONIA (NYCTAGINACEAE)

ALLIONIA INCARNATA L., TRAILING FOUR-O'CLOCK (1); A. NYCTAGINEA Michx., UMBRELLAWORT (2); other spp. (3). Mostly perennial herbs of plains and prairies, (1) in the Southwest, (2) in the Central and Western States, sometimes grown in wild gardens.

Albugo platensis (Speg.) Swing., white rust. Ariz., N.Mex., Tex., Tenn. (1); Ala. (2)
Ascochyta oxybaphi Trel., leaf spot. Iowa, Wis. (2)
Cercospora oxybaphi Ell. & Halst., leaf spot. Ill., Iowa, Kans., Nebr., Ohio, Tex. (2); Iowa, Kans., Wis. (3)
Heterosporium oxybaphi Patterson, on stems. Nebr., Tex. (3)
Peronospora oxybaphi Ell. & Kell., downy mildew. Kans., S.Dak. (2)
Phymatotrichum omnivorum (Shear) Dug., root rot. Tex. (2,3)
Puccinia aristidae Tracy (O,I), rust. Ariz., N.Mex., Tex. (3)

BOERHAAVIA (NYCTAGINACEAE)

BOERHAAVIA spp., SPIDERLING, WINE-FLOWER. Several annual or perennial herbs of arid plains and waste ground in the Gulf and Southwestern States and tropical America; mostly weeds as B. COCCINEA Mill. (1), and B. ERECTA L. (2); some of the other spp. (3) are useful to wildlife.

Albugo platensis (Speg.) Swing., white rust. Canal Zone, Hawaii (1); Tex., P.R., Virgin Is. (2); Ariz., Fla., N.Mex., Tex., P.R. (3)
Ascochyta boerhaaviae Tharp, leaf spot. Tex. (2)
Cercospora boerhaaviae Tharp, leaf spot. Tex. (3). C. furfurella Speg. Tex. (3)
Heterodera marioni (Cornu) Goodey, root knot. ? Fla. (1,3)
Phymatotrichum omnivorum (Shear) Dug., root rot. Tex. (2,3)
Xanthomonas campestris (Pam.) Dowson, bacterial spot. Tex. (2)

BOUGAINVILLEA. See PDR 24: 392. 1940.

MIRABILIS (NYCTAGINACEAE)

MIRABILIS JALAPA L., COMMON FOUR-O'CLOCK (1); M. MULTIFLORA (Torr.) A.Gray, COLORADO F. (2). Perennial herbs, (1) of tropical America (2) of the Southwestern States; (1) long cult. in gardens and locally naturalized, (2) also of ornamental value.

Aecidium mirabilis Diet. & Holw. (O,I), rust. Ariz., N.Mex. (2)
Albugo platensis (Speg.) Swing., white rust. Tex. (1)
Cercospora mirabilis Tharp, leaf spot. Tex.(1)

MIRABILIS cont.

Heterodera marioni (Cornu) Goodey, root knot. ? Fla. (1)
Phymatotrichum omnivorum (Shear) Dug., root rot. Tex. (1)
Puccinia aristidae Tracy (O,I), rust. Ariz. (2)

Curly top -- virus (Chlorogenus eutettícola Holmes, Beta virus 1 K.M.Sm.). Calif. (1)

NYMPHAEACEAE

NELUMBIUM

NELUMBIUM NELUMBO (L.) Druce, HINDU LOTUS (1); N. PENTAPETALUM (Walt.) Fern. (N. LUTEUM Willd.), AMERICAN L. (2). Perennial aquatic herbs; (1) of s. Asia, cult. in water gardens and locally escaped, (2) native throughout the Eastern, Central, and Gulf States; important food plants of wildlife.

Alternaria nelumbii Enlows & Rand, leaf spot. Md., N.J., N.Y., Pa. (1); Okla., ? Tex. (2)
Cercospora nelumbonis Tharp, leaf spot. Ind., Tex. (2)
Dothiorella nelumbii Ell. & F.W.Anders., on flower parts. Del., Md. (2)

NUPHAR (NYMPHAEACEAE)

NUPHAR ADVENA (Ait.) Ait. f., YELLOW PONDLILY, SPATTERDOCK. Perennial aquatic herb of shallow fresh water throughout the U.S.; a wildlife food plant.

Entyloma nymphaeae (D.D.Cunn.) Setch., white smut. Conn., Ill., Mass., Wis.
Mycosphaerella pontederiae (Pk.) House, leaf spot. Mo., Mich., N.Y., Va., Wis.
Phyllosticta fatiscens Pk., leaf spot. Iowa, N.J., N.Y., Wis.
P. nymphaeacea Ell. & Ev. Tex.
P. nymphaeicola Tehon & Daniels. Ill.

NYMPHAEA (NYMPHAEACEAE)

NYMPHAEA ODORATA Ait. (1), AMERICAN WATERLILY (1); N. TUBEROSA Paine, MAGNOLIA W. (2); other spp. (3). Perennial aquatic herbs; (1) and (2) are hardy and range throughout the Eastern and Central States, important food plants of wildlife. The spp. commonly cult. in water gardens are mostly of African origin but much modified by hybridization.

NYMPHAEA cont.

Alternaria sp., leaf spot. Tex. (3)

Cercospora exotica Ell. & Ev., leaf spot. Ill. (3)

C. nymphaeacea Cke. & Ell. Ill., Me., Mich., N.J., Tex., (1); Ill., Mich., Mo., Wis. (2); Miss., Tex., Va. (3)

C. nymphaeae Ell. & Ev. Ala. (1)

Entyloma nymphaeae (D.D.Cunn.) Setch., white smut. Mass. to Va., Okla. and Wis. (1,2); Md., Mass., N.J., N.Y., Tex., Wis. (3)

Helicoceras nymphaearum (Rand) Linder, leaf spot. Md., N.J., N.Y. (3)

Mycosphaerella pontederiae (Pk.) House, leaf spot. Va. (1); Mich. (3)

Ovularia nymphaearum Allesch., leaf spot. Wash. (1,3); Md., N.Y., Wash. (3)

Phyllosticta fatiscens Pk., leaf spot. Vt. (1)

P. nymphaeacea Ell. & Ev. Ala., Tex. (3)

Pythium spp., leaf and stem rot. Mass., N.Y., Wis. (1,2). Identified spp. include ? P. proliferum DBy., P. marsipium Drechs., and ? P. undulatum H.E.Petersen.

DIVISION OF MYCOLOGY AND DISEASE SURVEY